



Flange Lubrication on the Reading . . . Page 26

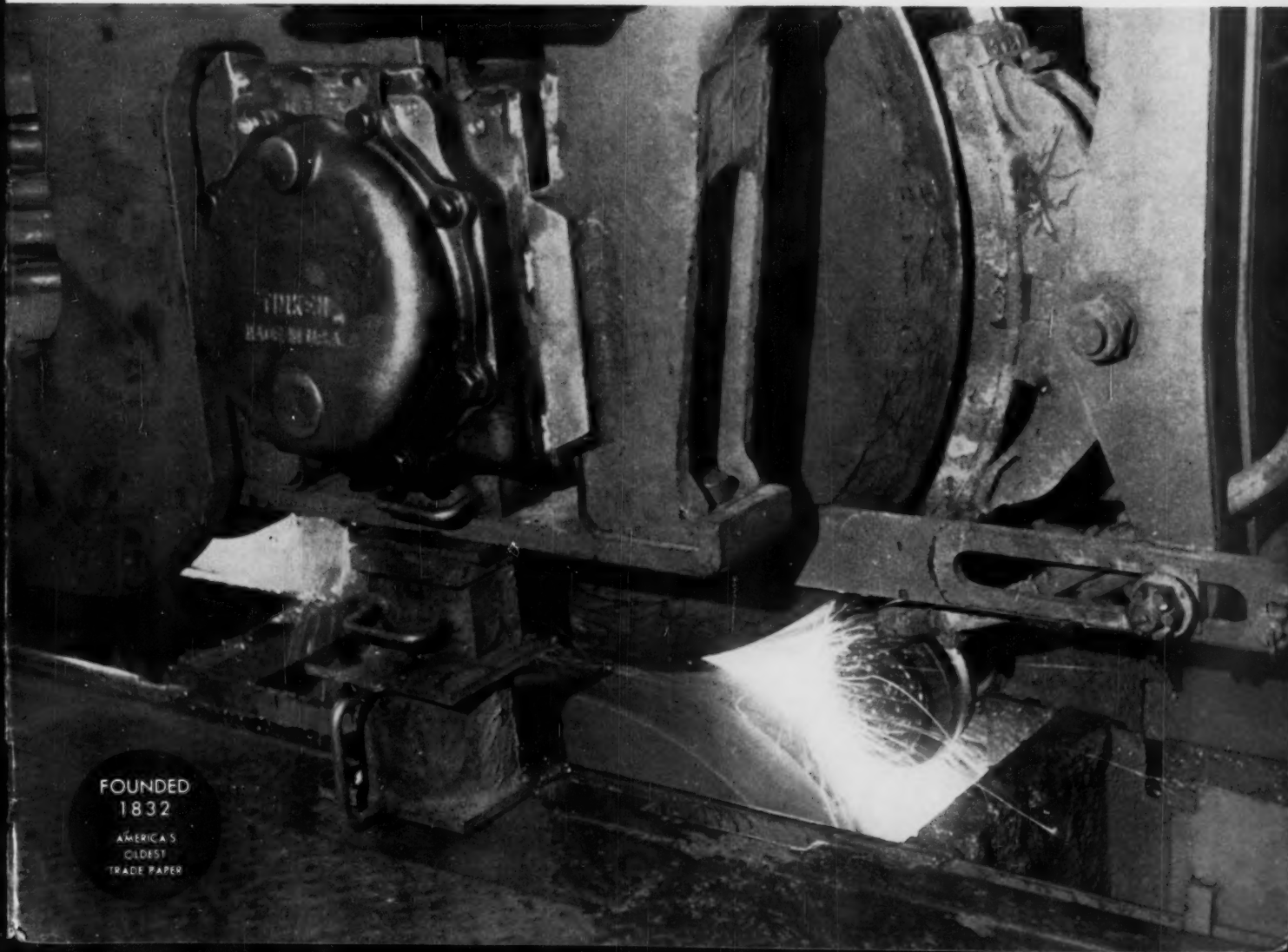
RAILWAY

LOCOMOTIVES AND CARS

A SIMMONS-BOARDMAN TIME-SAVER PUBLICATION

OCTOBER 1958

Long Island Modernizes Its Shops . . . Page 46



FOUNDED
1832

AMERICA'S
OLDEST
TRADE PAPER

MINER



CAST STEEL YOKES



For 24 $\frac{5}{8}$ and 18 $\frac{1}{2}$ inch Gear Pockets

THE PROVEN REPLACEMENT FOR THE OLD WROUGHT IRON YOKE

The splendid service records of more than 60,000 yokes testify to the correctness of the design and quality of the material used in these Miner Yokes.

An ingenious interlocking feature securely unites the yoke to the coupler and holds them in correct relationship.

Two vertical ties at the front end of yoke ensure full strength and safety.

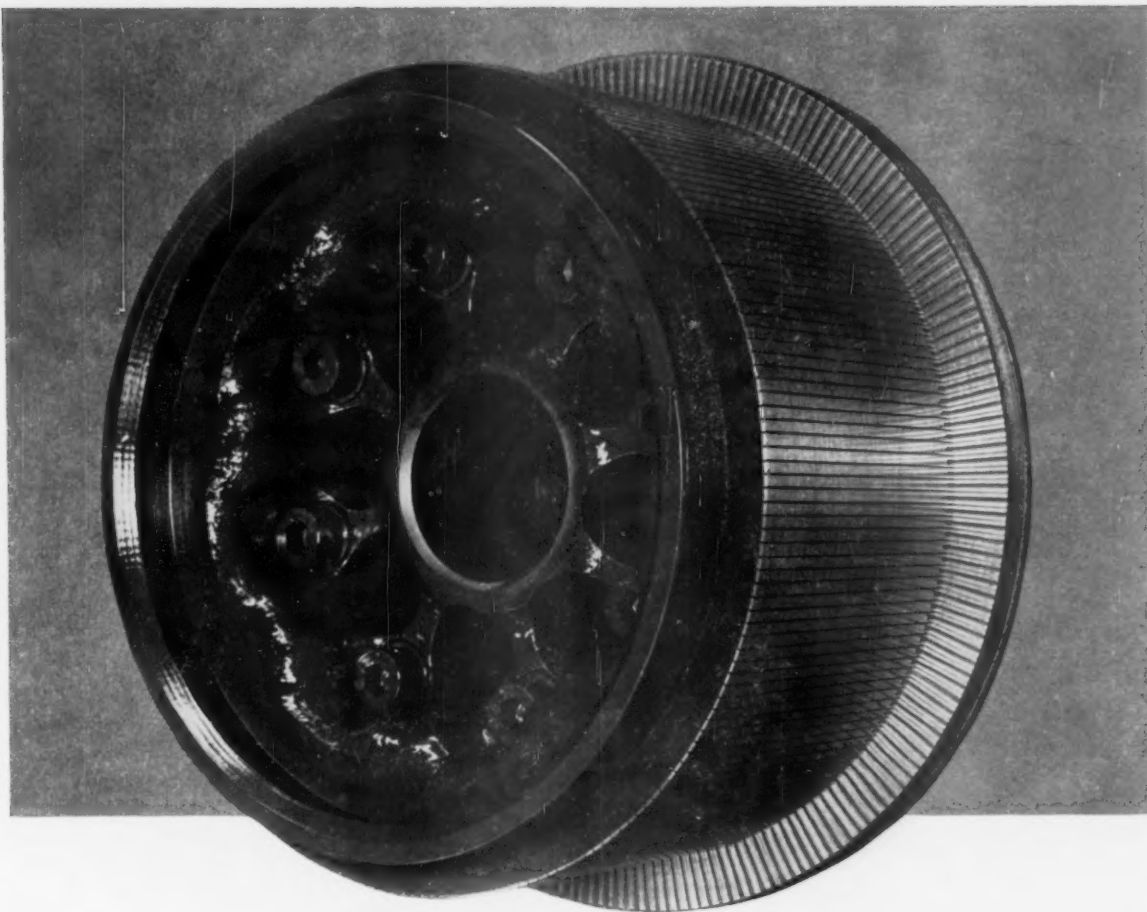
Exceeds AAR strength requirements.

For 24 $\frac{5}{8}$ " gear pocket D-8909—AAR-B-99

For 18 $\frac{1}{2}$ " gear pocket D-8911—AAR-B-100

Literature available

W. H. MINER, INC. CHICAGO



NATIONAL commutators for traction motors ***guarantee excellent performance because...***

- 1** Archbound construction holds segment mica in place by compression. It puts all the steel V-ring pressure radially inward on the 30° cone, wedging one commutator bar against the other in keystone fashion.
- 2** Mica V-rings bonded with epoxy blended resin withstand higher temperature and speed.
- 3** High silver content copper alloy bars operate at elevated temperatures without softening.
- 4** Segment mica is epoxy bonded to prevent breaking and throwing out of risers.

NATIONAL ELECTRIC COIL COMPANY

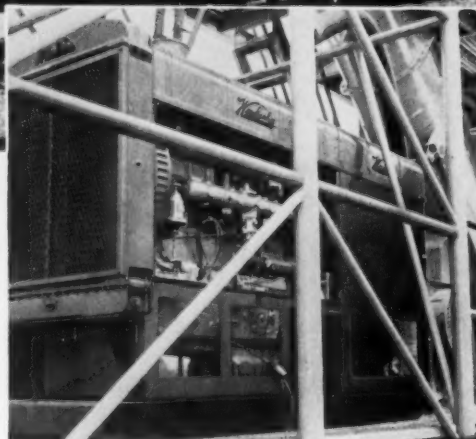
COLUMBUS 16, OHIO, U. S. A.



**ELECTRICAL ENGINEERS: MAKERS OF ELECTRICAL COILS AND INSULATION—
REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES**



WAUKESHA **ENGINATOR[®] powers** **Car Icing Machine Unit**



Moving on a track alongside refrigerated car trains... no icing platform needed... this mobile icing machine unit ices cars on either side. So flexible is its extending or retracting snout, that four hatches of adjacent ends of two cars can be iced from one position. With four men, a train is iced at two minutes per car.

This Waukesha-Enginotor-powered mobile unit is speeding the icing of the Pacific Fruit Express Co. cars at Eugene, Oregon. Its head-end 4-wheel tractor carries the power plant and icing machinery; and the four 4-wheel trailers

haul a total of 60 tons of ice in 300 lb. blocks.

On the tractor is a Waukesha 100 KW Enginotor (a gasoline engine operating at 1800 rpm direct-connected to a 240/480 AC 3-phase 60-cycle generator). It powers controls (in cab on snout), ice breaker and elevator delivering ice to snout, also chain elevator (through trailers) which feeds ice to breaker. Breaker makes coarse or fine ice, which is salted at the top platform. Waukesha Enginotors for gas, gasoline or Diesel fuels are available in 50 to 800 KW capacities. Send for descriptive bulletins.

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RAILWAY DIVISION WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN

RAILWAY LOCO- MOTIVES AND CARS

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in the United States
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REPORT FOR OCTOBER



The Chicago & Eastern Illinois' "Eliza Doolittle" is the 1,000th diesel locomotive to go through the upgrading process of Electro-Motive Division of General Motors at La Grange, Ill. New and upgraded components transformed a 12 year old E-7 unit that had run 1,600,000 miles to the new E-9 unit with 2,400 hp and new locomotive warranty.

Charges for Application of Journal Lubricating Devices

Following a study made by the Committee on
Prices for Labor and Materials, the AAR
Mechanical Division is suggesting a price
schedule for the application of various
journal lubricating devices to foreign and
private line cars if the railroads and private
car owners voluntarily subscribe to the plan.
Many private car owners are agreeable to

having railroads install these devices when
cars are due for periodic lubrication attention.
The suggestion reads:

"Journal Boxes: Periodical attention, in-
cluding jacking, removal and examination of
all journal wedges and bearings, removal of
waste packing and replacing with journal
lubricating devices and stenciling car, job
completed in all details as outlined in AAR
Lubrication Manual, per car, excluding ma-

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TIME SAVING IDEAS FOR OCTOBER

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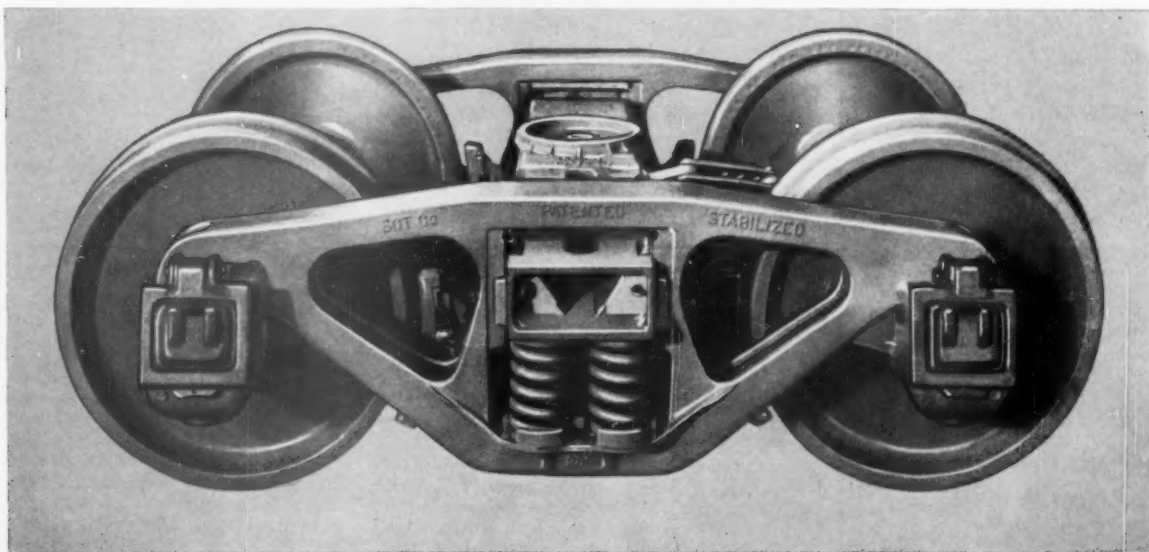
ELECTRICAL

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Experienced Car Builders BEGIN WITH



BARBER

STABILIZED TRUCKS

Today's heavier, high speed railroading demands years ahead freight car performance. Better design, better quality from rail to roof can achieve it. So, "Begin with Barber Stabilized Trucks." You provide a smoother ride, with variable friction for variable loads...protect other equipment and save on lading damage claims. Proof—*more than 475,000 Barber car sets sold...none has ever worn out!*

Standard Car Truck Company,
332 South Michigan Avenue,
Chicago 4, Illinois. *In Canada:*
Consolidated Equipment Com-
pany, Ltd., Montreal 2, Quebec.

REPORT FOR OCTOBER—Continued from page 5

terial cost of lubricators as follows: 8-in.—\$12.95, 9-in.—14.70, 19-in.—16.45, 11-in.—19.85. In case where lubricators are furnished by car owner, no additional charge is in order; however, where lubricators are taken from stock of repairing road, additional charge should be made per Rule 105."

This schedule is suggested for use on an interim basis. When more experience is obtained, it might be possible to include provisions in the Interchange Rules for this work. There may be some cases where parties subscribing to this plan may wish to negotiate their own basis for charges. In the absence of special agreements, the AAR feels it would be entirely equitable to use the above schedule. The charges would remain in effect until economic conditions might change one or more of the cost factors. They would then be reviewed by the Price Committee.

It is to be understood that this price schedule could be used in all cases where either private car lines or railroads wish to subscribe to this plan. Where a private car line or a railroad not having done so wishes to authorize railroads in general to install spe-

Orders and Inquiries for New Equipment

Placed Since the Closing of the September Issue

Freight Cars

Road and builder	No. of cars	Type of car	Cap. tons	Other detail
CHICAGO & NORTH WESTERN: Pullman-Standard	1,000	Box	—	40-ft. 6-in. all-steel cars with 8-ft. doors. Deliveries to begin Oct. 20 at about 90 cars per week. Cost estimated at more than \$7 million.
MISSOURI-KANSAS-TEXAS: General American	20	Covered hopper	—	Airslide. Delivery late this year.
MISSOURI-PACIFIC: General American	50	Covered hopper	70	Airslide. Delivery to begin this month.
Company shops	600	Box	50	Under construction.
TRAILER TRAIN CO.: American Car & Fdry.	200	Flat cars	—	Cars (400) to be 85-ft.; equipped with roller bearings, rubber cushioned draft gears, and built-in semi-automatic devices for securing trailers to cars. For delivery November and December.
Pullman-Standard	200	Flat cars	—	
UNION PACIFIC: Company shops	100	Cabooses	—	Cost, approx. \$1.9 million. Construction to begin in November.

cific types of journal lubricating devices to its cars when due for periodic attention, the AAR Mechanical Division office should be

notified. Circulars would then be issued at appropriate intervals to make this known to all concerned.



Ralph O. Johnson
M-K-T



E. W. Kettering
General Motors



David M. Lyon
General Motors



Harold M. Nelson
North American Car



Eustace Lingle
Oakite



Henry V. Bootes
ACF Industries

Personal Mention

Canadian National.—Montreal: H. L. McCAGG appointed mechanical engineer (diesel).

Chicago, Milwaukee, St. Paul & Pacific.—Seattle, Wash.: H. R. MORGAN, assistant electrical engineer, appointed electrical engineer, succeeding E. C. BARNES, deceased. Tacoma, Wash.: D. D. FISHER appointed district general car foreman, Bensenville, Ill.: W. C. MAUER appointed district general car foreman, succeeding Mr. Fisher. St. Paul, Minn.: V. L. WATERWORTH appointed district general car foreman, succeeding Mr. Mauer. Savanna, Ill.: H. F. SHANNON appointed district general car foreman, succeeding Mr. Waterworth. Milwaukee Terminal: H. R. ANDERSON appointed district general car foreman, succeeding Mr. Shannon. Headquarters, Davies Yard.

Erie.—Marion, Ohio: HARRY I. PHELPS, master mechanic, retired.

Great Northern.—St. Paul, Minn.: DONALD F. MARSTON, mechanical assistant, appointed

mechanical engineer, succeeding WILLIAM C. MILLER, retired.

Missouri-Kansas-Texas.—Parsons, Kan.: RALPH O. JOHNSON appointed chief mechanical officer, succeeding HARRY S. TURNER, retired. Mr. Johnson formerly assistant chief engineer, communications and signals, at Denison, Tex.

New York, Chicago & St. Louis.—Calumet, Ill.: CARL L. MILLER appointed general engine-house foreman.

Pennsylvania.—Baltimore, Md.: A. O. TAYLOR appointed superintendent of equipment, Chesapeake region. Altoona, Pa.: H. S. MILLER appointed superintendent locomotive shop, succeeding Mr. Taylor. Mr. Miller formerly master mechanic, Columbus, Ohio.

Southern.—Winston-Salem, N.C.: JAMES A. CRENSHAW, appointed general foreman. Formerly assistant foreman enginehouse at Columbia, S.C. Rock Hill, S.C.: JOHN H. W. MILLER appointed general foreman. Formerly general foreman at Winston-Salem. Birmingham, Ala.: JOHN I. VARDAMAN, Jr., appointed road foreman of engines.

Supply Trade Notes

GENERAL MOTORS CORPORATION, ELECTRO-MOTIVE DIVISION.—E. W. Kettering has been named to the newly created post of research assistant to the general manager. David M. Lyon has been appointed director of research. Mr. Lyon was previously executive research engineer.

NORTH AMERICAN CAR COMPANY.—Harold M. Nelson appointed assistant vice-president—mechanical. Mr. Nelson previously general mechanical superintendent, Fruit Growers Express Company.

OAKITE PRODUCTS, INC.—Eustace Lingle, vice-president, named vice-president in charge of industrial sales and education.

ACF INDUSTRIES, INC., SHIPPER'S CAR LINE DIVISION.—Henry V. Bootes, executive (Continued on page 60)



Photo at left was taken twenty years ago when the FT freight locomotive was introduced. Now, after millions of miles of service, this FT can be turned in on the purchase of new General Purpose units like the one shown above. Besides gaining increased capacity, the new units carry the same warranty, low maintenance and operating costs as completely new locomotives.



New locomotives for old . . .

Increased capacity for faster schedules

Turning in old FT freight locomotives for new General Purpose locomotives containing certain remanufactured components is providing railroads with an important "extra" dividend—increased capacity without increasing the locomotive fleet!

For example:

At this speed mph	it takes this number units		to haul this tonnage
	FT	New GP9	
30	4	3.03	9,933
40	4	2.97	5,909
50	4	2.89	3,637
60	4	2.79	2,328

Three of the new GP9 units do the work of four FT units. A gain in capacity of *one additional* GP9. This method of gaining new power can be put to advantage on your road. For details, call your Electro-Motive representative.



ELECTRO-MOTIVE DIVISION GENERAL MOTORS

LAGRANGE, ILLINOIS • HOME OF THE DIESEL LOCOMOTIVE

In Canada: General Motors Diesel Limited, London, Ontario

LOCOMOTIVES AND CARS WHAT'S NEW IN EQUIPMENT

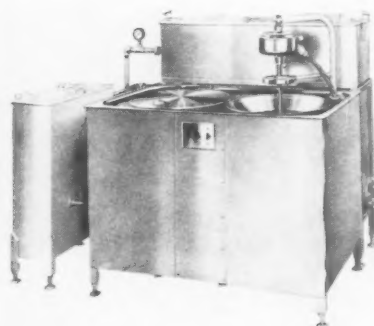


Sleeve-Type Journal Bearing

The Allison Kar-Go sealed journal bearing has been redesigned so it can be applied to roller-bearing axles. The improved unit also will fit AAR approved integral side frames modified for roller bearing applications. Other changes include redesign of the malleable iron housing to include the wedge. The cover has a large oil filler plug for better filling and easier oil-level inspection.

The bearing, now in quantity production,

successfully completed initial laboratory tests in 1955. The original design has accumulated nearly 75 million unit miles on 38 American and Canadian railroads. During the three year tests, bearing inspections averaged only one every 20,000 miles in many applications. Oil additions are said to be averaging less than a pint each 75,000 miles. *Allison Div., General Motors Corp., Dept. RLC, Indianapolis, Ind.*



Journal Lubricator Cleaner

This Triplex cleaning unit, adapted for cleaning journal lubricators, is said to clean from 18 to 24 dirty lubricators per hour. Added to the washer and extractor is an automatic oil heating device with temperature regulation, using either steam or electric immersion heater. Pumps, valves and filter are designed to handle the heavier car oil.

Dirty pads are placed in the washer (left tub) for about 10 min to remove dirt, lint and water. Hot oil at 240 deg is continuously circulated through the tub, then filtered and returned to the storage tank in the rear of

the unit. The reversible agitator in the tub is gear driven. After the oil bath, pads are run for about 7 min in the 15-in. high-speed extractor (right tub) for maximum oil extraction. The spinner is driven by a motor below the basket, through a flexible shaft and overhead friction drive. The friction drive allows spinner basket to be stopped by hand pressure for greater safety when unit is run by inexperienced operators.

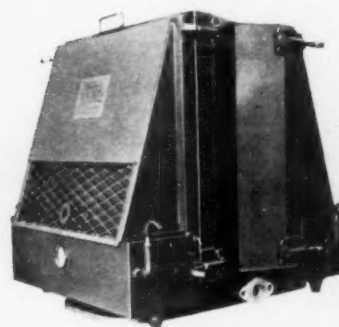
According to the manufacturer, the unit has proved efficient, easy and inexpensive to operate and sturdy enough to withstand heavy-duty use. It is eligible for Underwriter's Laboratory approval. *American Laundry Machinery Company, Dept. RLC, Ross & Section aves., Cincinnati 12.*

Roller Bearing Grease

Gulfcrown RR, a lithium-soap-base material, is one of the first greases for roller bearing lubrication to be approved under AAR Specification M-917-56. It showed no evidence of high temperature rise within the bearings. Subsequent tests revealed that the Gulfcrown Grease RR retained oxidation stability and did not soften. *Gulfcrown RR*

also proved its compatibility with other AAR-approved greases.

The new grease, with a typical consistency of No. 0, is compounded with refined oil and an oxidation inhibitor. Corrosion protection is provided by additives with effective anti-rust properties. Its hard freezing point is minus 50 deg F. The grease pumps freely at 0 deg F, won't thin out at high speeds, and resists washing action of water. It is available in 35-lb pails and 100- and 400-lb drums. *Gulf Oil Corp., Dept. DM, Dept. RLC, Gulf Building, Pittsburgh 30.*



Panel Type Oil Bath Filter

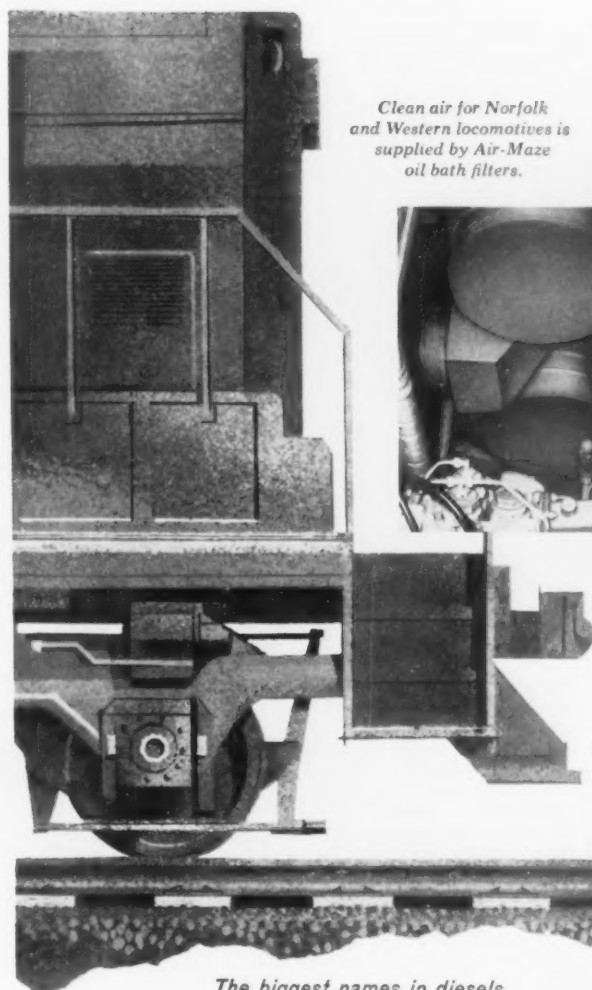
This panel type, oil-bath, engine air filter, built specifically for railroad use, can be applied to existing vertical panel adapters on diesel engines. Dust arresting efficiencies are said to be in the range of 90 per cent. The unit incorporates principles of oil wetting and cleaning of media used on other Air-Maze oil-bath filters. The Panelbath filter, built for operating conditions varying from 400 to 1,750 cfm, provides high dirt removing efficiency at a maximum pressure drop of approximately 5-in. of water. The Panelbath, designed for use where dust concentrations are moderate, mounts on the conventional vertical panel adapters and only requires the installation of four holding clamps.

Under normal dust conditions, servicing of the filter involves periodic checking of oil level and the occasional draining and filling of a 5-qt reservoir with conventional SAE 40 engine lube oil. Intake air is drawn through the front grill and divided into two flows. One flow is directed to the media; the second flow is directed through an oil control trough, picking up oil droplets and carrying the droplets to the filter media, creating a wetting action. The intake air deflects a calibrated baffle. At idle speeds the baffle is closed, insuring the required air to be deflected through the oil control trough. As the oil drains from the media, the oil carries impinged dirt particles to a sump at the bottom. The oil then returns to the reservoir where the circulation cycle is repeated. *Air-Maze Corp., Dept. RLC, 25000 Miles Road, Cleveland 28.*

(Turn to page 12)

Service on Norfolk and Western shows:

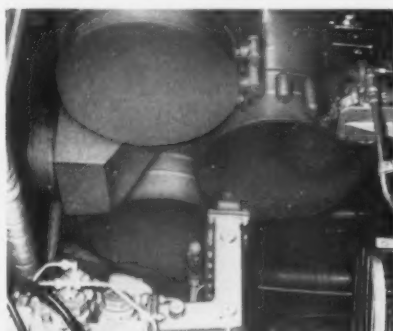
AIR-MAZE OIL BATH FILTERS GIVE LONG POWER ASSEMBLY LIFE



Clean air for Norfolk and Western locomotives is supplied by Air-Maze oil bath filters.

The first Air-Maze oil bath filter installed on the air intake of a Norfolk and Western 1800 hp Alco diesel locomotive equipped with the Model 251 engine was placed in service in 1956. 140 N & W locomotives are now equipped with Air-Maze oil bath filters.

The reasons for using Air-Maze filters are clear. After two years of heavy freight service, one of the 1800 hp locomotives was brought into the Roanoke Shop for inspection. This is what the inspection showed:



1. Pistons and rings in excellent condition. Ring and groove wear minimum. Rings free, none broken or bald. Crowns of pistons clean with normal buildup.
2. Chrome-plated cylinder liners showed negligible wear.

As a result of this inspection, overhaul period has been appreciably extended. Maintenance calls for draining and refilling oil bath filter every 90 days, cleaning annually.

For details, contact your locomotive builder or the Air-Maze Corporation, Cleveland 28, Ohio.

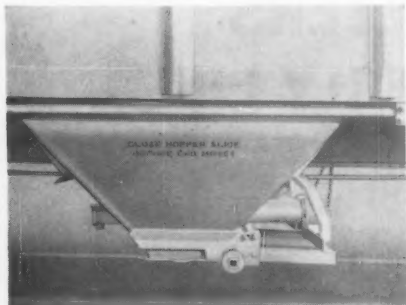


*The biggest names in diesels
are protected by Air-Maze filters*

AIR-MAZE
The Filter Engineers

ENGINE AIR FILTERS • CAR BODY FILTERS • LUBE OIL FILTERS • OIL SEPARATORS • PASSENGER CAR FILTERS

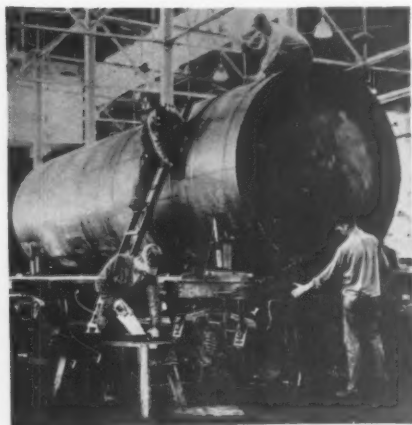
WHAT'S NEW IN EQUIPMENT—Continued from page 10



Pneumatic Outlet

This newly developed pneumatic valve, combined with the Enterprise cast steel frame and gate, offers a choice of two unloading systems for covered hopper cars—the conventional gravity-flow bottom discharge and pneumatic conveying. Designed for sanitation, and easy unloading of dry granular or powdered commodities, it can be used with any type or size of vacuum system. The valve can be applied to existing hoppers or new cars.

The outlet consists of an atmospheric air inlet valve and a lading outlet valve. A 50-deg angular air-stream conduit of $\frac{3}{16}$ -in. steel plate is placed longitudinally in the hopper to provide a bridge between the inlet and outlet valves. The bottom edges of the conduit are located $\frac{1}{2}$ in. above the sliding discharge gate. When a pneumatic system is connected to the outlet valve, an air stream is created in the hopper bridge circuit drawing the lading through the $\frac{1}{2}$ -in. opening between the conduit and the sliding gate and through the outlet valve and conveyor system to the storage bin. *Enterprise Railway Equipment Company, Dept. RLC, 59 East Van Buren st., Chicago 5.*



Insulation Material

Rubatex Insulated Hardboard has been used by Union Tank Car to insulate a group of railroad tank cars for transporting liquid carbon dioxide. Blocks of 2-in. thick Rubatex, 27 x 54 in., were fabricated to fit the tank-car contour. A cold adhesive was

employed. No vapor barrier was used because the rubber material does not absorb moisture.

The material has also been used in refrigerator cars. It is said to have the lowest coefficient of thermal conductivity of any structural material known. Based on plioflex synthetic rubber, millions of tiny nitrogen filled cells are dispersed in a matrix of the rubber. *Rubatex Div., Great American Industries, Inc., Dept. RLC, Bedford, Va.*



Carbon-Brush Holder

A carbon-brush holder, consisting of a one-piece die casting and coiled spring, is said to eliminate the need for periodic adjustment of brushes and greatly reduce excessive or destructive sparking, minimizing both brush and collector ring wear.

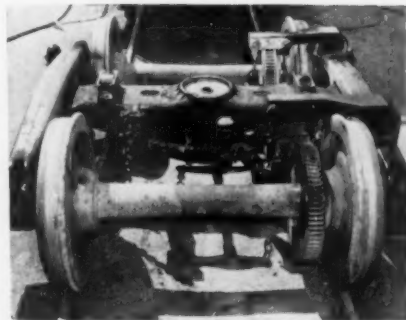
For direct-current equipment, the holder has an easy vision inspection window. When the brush rivet appears in the opening, it is time to replace the brush. Pressure is automatically held constant against the commutator at all stages of brush wear.

The holders can be substituted or adapted for use to replace old pin-adjusting holders on presently installed alternating- or direct-current motors and generators. They are said to give up to 50 per cent longer wearing length. Changing brushes in this constant-pressure holder requires three or four simple steps. *Large Motor & Generator Dept., General Electric Company, Dept. RLC, Schenectady, N.Y.*

Disc Freight Brake

A truck-mounted package, the Frate Brake differs from the Budd disc passenger brake only in certain mechanical features. For all but the heaviest freight cars, there would be only one of the 24-in., double-surfaced braking discs per axle. While in the application shown the brake units are supported from the truck side frame, it is believed that most applications would be made to the bolster because this simplifies wheel changes. In either case, the brake units are supported by hangers attached to cantilever brackets.

Because of the lateral in the freight-car



truck, it was necessary to depart from the long-lever principle of the passenger brake and use a C-clamp design with fixed and movable jaws. The fixed jaw, supporting the outer brake shoe, becomes the main member of the carriage supported by the hangers. The movable jaw, supporting the inner brake shoe, is carried by a lever fulcrumed on the carriage and actuated by an air-operated cylinder—or actuator—also mounted on the carriage. A guide link paralleling the load arm of the lever takes most of the vertical brake reaction of the movable shoe and at the same time forms one side of a parallelogram—a four-bar link mechanism designed to keep the movable shoe parallel to the disc in a horizontal plane. This linkage also keeps the shoes aligned in a vertical plane. The shoe lining differs from that used on passenger car brakes because it is necessary to compensate for the weight variations of freight cars and so that the braking action will be compatible with tread brakes. The actuator consists of a pressed-steel air cylinder which has a diaphragm instead of a packing cup and piston. *Railway Division, Budd Company, Dept. RLC, Philadelphia.*



Air Tools

Two air-powered Impacttools, size 5081T Torque Control Impactool (50 to 150-ft-lb range) and size 5081 Impactool for nut running jobs up to $\frac{3}{4}$ -in. bolt size, have air-balanced throttle valves for easily controlled throttle graduation and trigger pull. Muffling is designed so the operating air passes through three expansion chambers which eliminate exhaust noises. Reversing is done by shifting

(Continued on page 58)

ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL RR
FIRM NORTHERN PACIFIC RAILWAY
South Tacoma, Wash.



RR diesel gears show only $\frac{1}{2}^\circ$ wear in $2\frac{1}{2}$ million miles

Timing gears on this Northern Pacific GMC-diesel locomotive engine, lubricated with RPM DELO Oil RR, recently completed $2\frac{1}{2}$ million miles of severe freight service without repairs or adjustment. NP's South Tacoma Shop Foreman, A. R. Genin (above), indicates degree marks on engine flywheel, used to gauge gear wear. Tolerance between gear teeth shows variance of just $\frac{1}{2}^\circ$ from original setting. Mr. Genin says, "We consider this low rate of wear remarkable for heavy-duty freight operation. It is typical of our experience during the 12 years we have used RPM DELO Oil in all our locomotive diesels." Engines are 1350 h.p. 16-567 series.

Why RPM DELO Oil RR reduces wear, corrosion



- Oil stays on engine parts—hot or cold, running or idle • Anti-oxidant resists lacquer formation • Detergent keeps parts clean • Special compounds prevent corrosion of bearing metals • Inhibitor resists foaming.



TRADEMARK "RPM DELO" AND DESIGN REG. U. S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

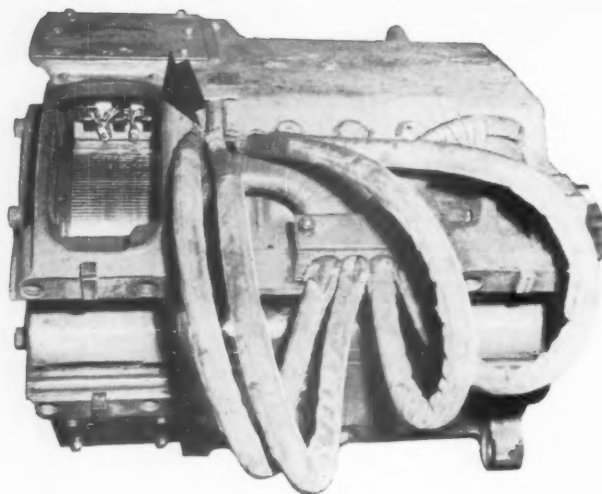
about RPM DELO Oils or other petroleum products of any kind, or the name and address of your nearest distributor, write or call any of the companies listed below.

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado



"Only one traction
motor brush can keep
up with the tonnage-train
traffic on the L&NE!"

*comments Mr. Edward C. Kaiser,
Chief Mechanical Officer*



"The Lehigh & New England is an all-freight railroad," Mr. Kaiser continues. "Tonnage trains that put peak loads on motive units are the everyday story. Grades as steep as 2.4 and sharp curves mark the contour of the line — a combination that requires lots of dynamic braking."

"When you turn a traction motor into a generator at the operating speeds and loads prevailing on the L&NE, the brushes have to be able to take real punishment."

Experience has taught the L&NE that SPEER Brushes were the only brushes tried by it that could take this treatment—and stand up. "We have used SPEER Traction Motor Brushes (grade E-44) exclusively for over four years on all road units and road and yard switchers," Mr. Kaiser concludes, "It is the only brush that has stood up satisfactorily."

We can't think of a better endorsement for the brushes that have proved themselves in millions of miles of this kind of railroad service. SPEER builds a complete line of high-performance brushes for every railroad application. If you'd like to know more about the important cost savings that are built into all SPEER Brushes, write today for your free copy of the booklet, BRUSHES BY SPEER!

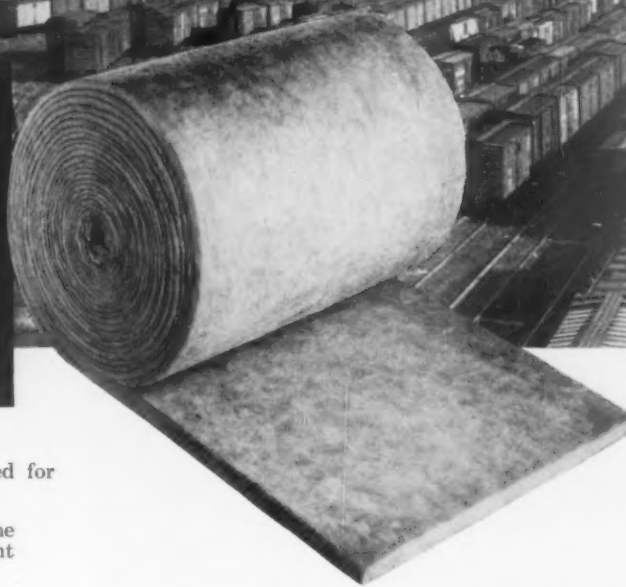
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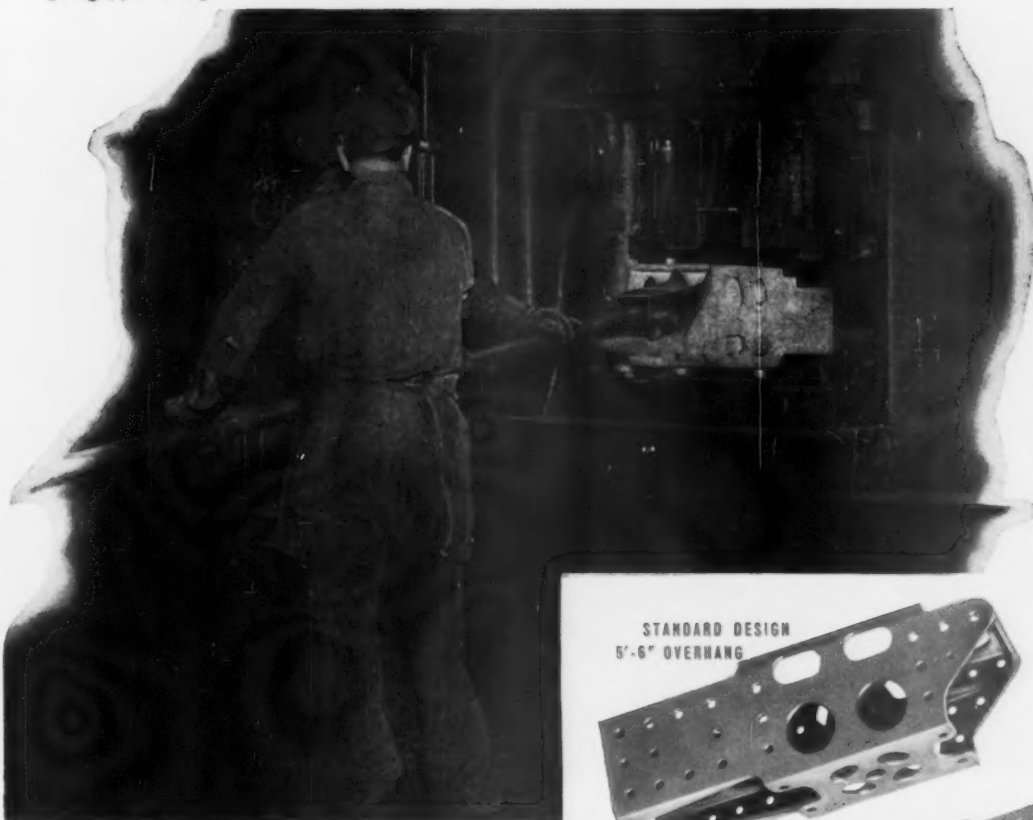
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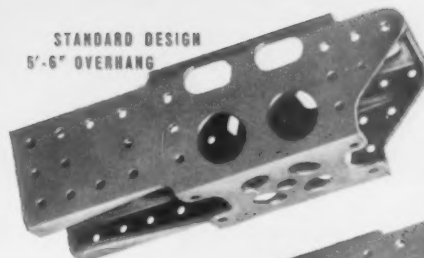
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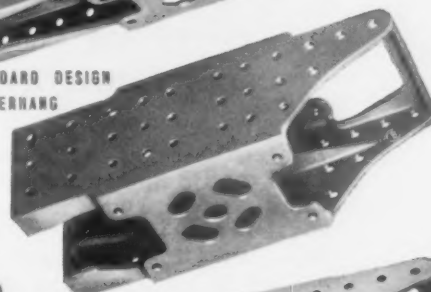
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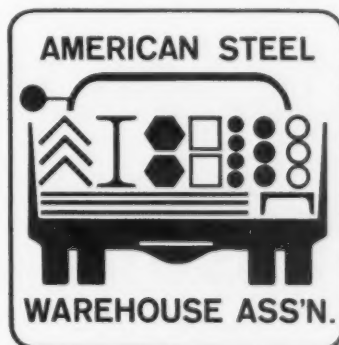


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**TODAY—OIL BUILDS for your TOMORROW
OIL PROGRESS WEEK, OCTOBER 12-18**

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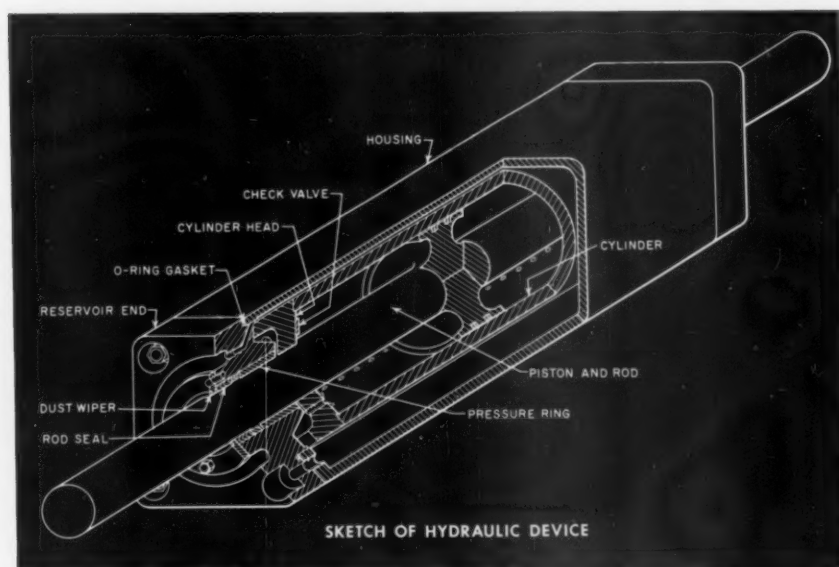


RAILROAD PRODUCTS



Hydraulic shock control arrangement is combined with DF loading equipment in these new box cars.

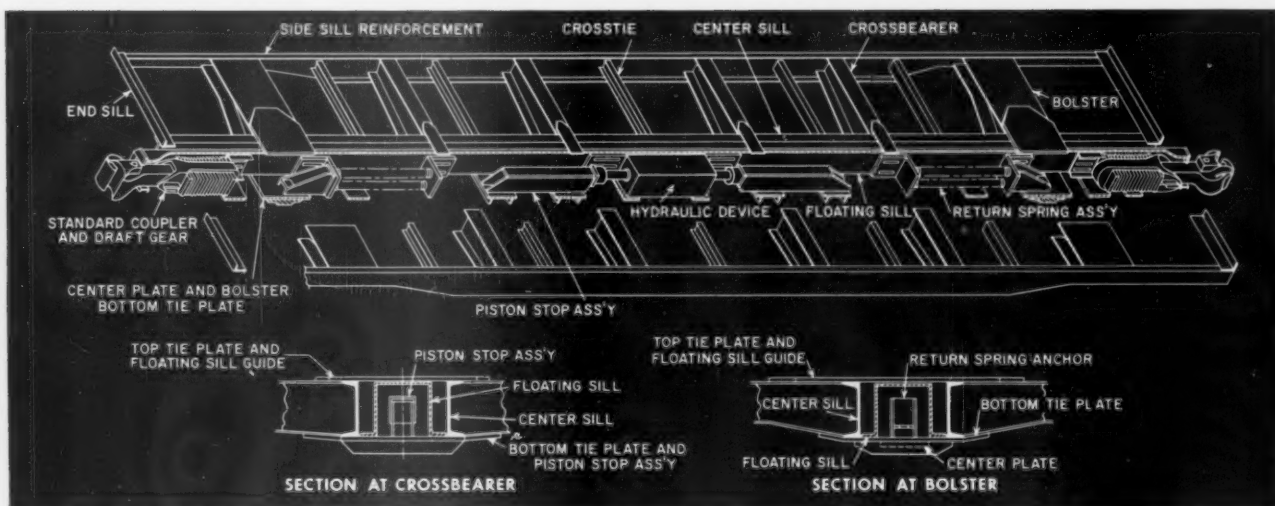
Santa Fe Builds 100 Shock Control Cars



Hydraulic cylinder mounted at center of the car has graduated orifices which control part of oil flow between two sides of double-acting piston.

BY THE END of September, the Atchison, Topeka & Santa Fe had 100 new "shock control" cars in operation to provide better protection to lading and reduce damage claims. Like the SP Hydracushion car, each new Santa Fe car has a floating sill and return springs. The AT&SF uses a hydraulic piston and cylinder instead of sliding and fixed brake plates, actuator and hydraulic metering pin assembly, (RL&C, May 1957, p. 53).

Designed and being built by the Santa Fe at the Topeka shops, the cars are a modified conventional 50-ft 6-in. DF box car with a floating underframe having 10-in. travel in either direction. The travel is retarded by a double-acting piston and cylinder contained in a housing located horizontally in the middle of the car between the center sills. Impact energy is absorbed in both buff and draft. Although designed to absorb high impact energy, there is no inherent recoil in this device. Santa Fe spokes-



Floating center sill fits between fixed center sills and is restored to normal position by return springs at bolsters.

men say its use with conventional high capacity draft gears protects fragile lading at impact speeds up to approximately 12 mph.

How Hydraulic Piston Works

The space between the outer cylinder wall and housing is filled with hydraulic fluid to within 2 or 3 per cent of capacity. Orifices of predetermined diameter and location are spaced at the bottom of the cylinder to permit oil to flow out of the cylinder. When the double-acting piston is displaced from its center position to the right, the oil on that side of piston is compressed and is forced out through the orifices. This movement of oil opens the check valve in the left cylinder head wall and allows oil to enter on that side of piston. Some oil also enters through orifices on that side. As the orifices are closed by the piston movement, the pressure rises but

does not go up very fast because of the oil being forced out the remaining orifices. The pressure curve builds up in a fraction of a second at the beginning of the stroke, then levels off. The shock of impact is eased in this manner.

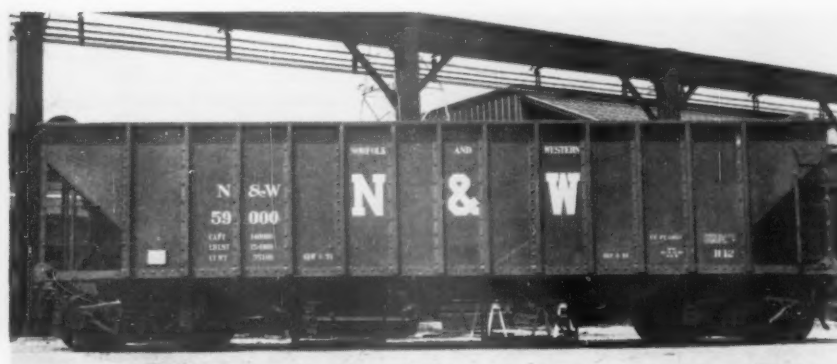
Floating Underframe

The floating sill runs the full length of the car. At each end, standard couplers and draft gears are applied. One end of the springs in the return spring assemblies (two per car) seats against an anchor casting welded to the bottom tie plate at the bolster. The other end seats against an L-shaped casting welded to the side of the movable sill. The springs are under compression when assembled. The piston and cylinder housing is welded to supports across the bottom of the fixed center sill and is independent of the floating sill. The piston stop assemblies (two per car) are welded to

carrier support plates which in turn are welded to the floating sill. A movement of the floating sill to the right compresses the return springs on that side. After movement of the piston stops and work is done absorbing the shock, the springs gradually return the piston to its position at the center of the cylinder, eliminating recoil.

Equipment on these cars includes roller-bearing, ride-control trucks with long travel springs. The 6 x 11 journals compensate for the additional weight of the cushioning device and provide a 60 ton capacity for the car instead of the conventional 50-ton capacity generally specified for a car in this service. Standard DF loading equipment consists of 9 belt rails, 50 cross members—10 each of the 24-in. and 48-in. deck bars—and 8 doorway members. The clear door opening is 8 ft by 9 ft 10 $\frac{5}{16}$ -in. The cars are painted Indian red with black and white stenciling.

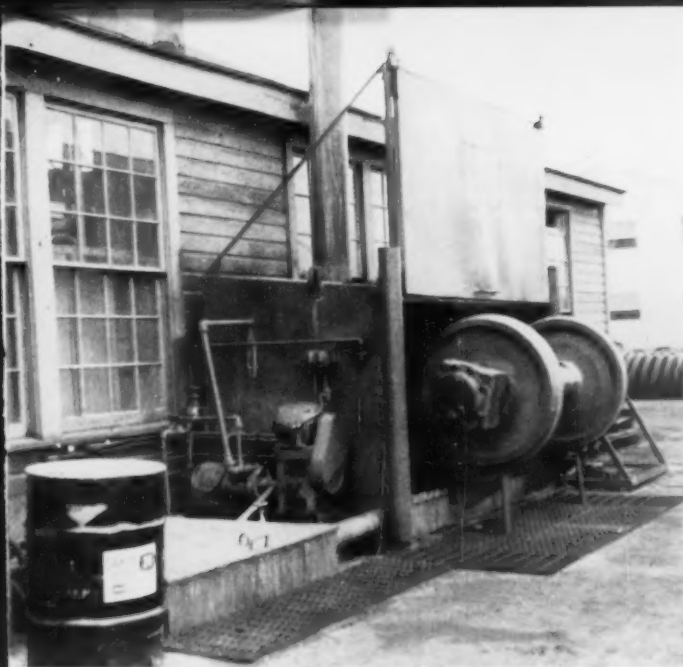
Standardized Hopper Cars Have Been Completed



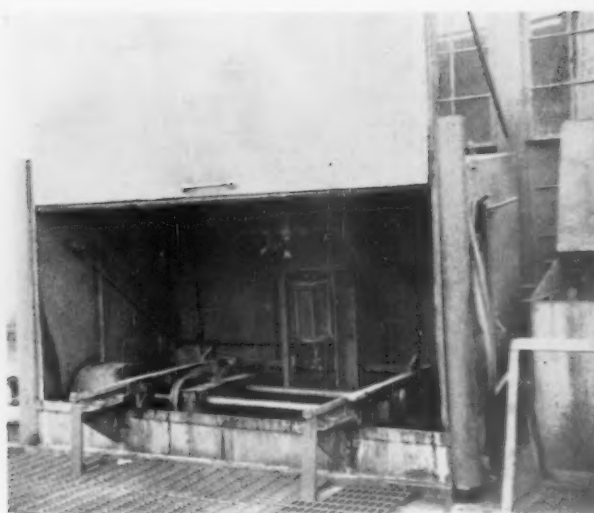
Stenciled, but not painted to simplify strain gage applications, the N&W car weighs 55,000 lb and is 40 ft 11 $\frac{1}{2}$ in. over the strikers.

Each of three cooperating roads, participating in a standardized hopper car design announced last month, has completed a sample car (RL&C, September 1958, p 18). Chesapeake & Ohio, Norfolk & Western, and Pennsylvania have delivered their newest hoppers to the Technical Center of National Malleable & Steel Castings at Cleveland for a series of laboratory impact tests.

The design which represents combined efforts of the three roads, will be finalized after laboratory and road tests and offered to all roads and car builders as a standard. Standard steel plate sizes and shapes are used in the construction.

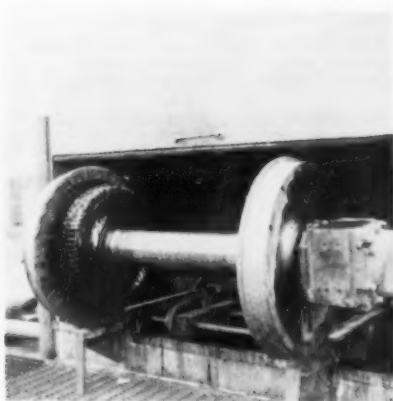


Cleaning machine is located outside wheel shop.

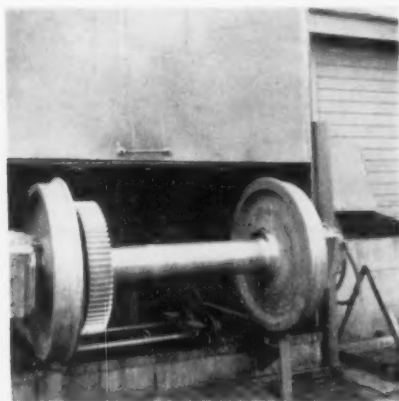


Rotating equipment and nozzles are in cabinet.

How SP&S Cleans Diesel Wheels



Entering cabinet is set of dirty wheels.



Wheels, axle and gear are thoroughly cleaned.

A DIESEL WHEEL-WASHING machine, installed just outside the wheel shop of the Spokane, Portland & Seattle at Vancouver, Wash., about a year ago, has effected appreciable savings in both the time and cost of cleaning diesel locomotive wheels. The machine is practically automatic in operation, once a pair of mounted wheels is placed in it. Even the dirtiest wheels, with heavily encrusted dirt and grease on the plates, hubs and driving gear, are thoroughly cleaned in 30 min or less. This can be compared with the former practice of manual cleaning which took two men half a day with a solution spray nozzle, hand scraping, and wiping. As a matter of fact, the wheels were never gotten entirely clean by this method and the messy wheel tracks and surrounding grounds always constituted quite an eyesore and safety hazard.

All parts of the new SP&S wheel washer were made of salvage materials. The housing, about 9 ft wide by 6 ft high by 5 ft deep is made of 16-gauge steel, applied over a 1-in. angle-iron frame. A 12-in. vent pipe, extending upward from the sheet metal hood, easily clears the housing of steam and fumes when the front door is open. This vertical sliding front door is counterbalanced by two $\frac{1}{8}$ -in. steel cables connected over 5-in. pulleys to suitable weights which move up and down in $5\frac{1}{2}$ -in. pipe guards on either side of the door. The heavy door can be easily raised or lowered by hand whenever necessary.

Inside the housing, the heavy steel base of the machine supports two pairs of 10-in. friction drive wheels spaced on 20-in. centers, mounted on roller bearing shafts and arranged to support and rotate the diesel wheels on their flanges. The drive wheels themselves are flanged to hold the diesel wheels in place lengthwise while being revolved at 4 to 5 rpm. The front shaft is power driven and turns at 16 to 20 rpm with $1\frac{1}{2}$ to 1 gear reduction from a 3-hp. electric motor just outside and at the left of the housing. One precaution found necessary, by experience, is to cover all plain or roller bearings with metal guards. Otherwise, the strong solution spray used to clean diesel wheels washes out the grease lubricant quickly and causes bearing failures.

Another heavy angle iron frame which supports the diesel wheels on their treads, except while being rotated, is hinged to the machine base at the front and pin-connected to a 10-in. by 12-in. air cylinder with pressure head and piston at the back. Operation of this piston, under valve control from the front of the machine, raises the wheel-supporting frame 4 to 5 in. at the rear and allows the wheels to roll out easily onto two 18-in. outside rail extensions. Diesel wheels are loaded and unloaded by lift truck from these rail extensions which have sliding sections to fill the gaps required for complete closing of the large front door during operation of the machine.

(Continued on page 54)

Railroads Are Developing Variety of

'Super Jumbo' PS-2 Covered Hoppers on the Burlington

THE BURLINGTON has just received 100 "super jumbo" cover hopper cars from the Butler, Pa., plant of Pullman-Standard. The cars have 3,219 cu ft capacity and were designed and built to provide increased capacity and new economies in the shipment of bulk commodities. This is the largest standardized PS-2 ever built and compares with the "jumbo" model which has 2,893 cu ft capacity and the standard car with 2,003 cu ft. Although the super jumbo car is higher and wider than the others, the overall length of 46 ft over end sills is maintained. Locations of loading hatches and unloading gates are unchanged so cars can be used with existing facilities.

Some of the cars are specially designed for handling specific commodities and are fitted with pneumatic outlets in addition to the regular outlet gates to speed unloading. When used in malt service, the cars can carry the malster's standard unit sale of 3,000 bu. Other products that will be carried include soy bean meal, brewers grits, dehydrated alfalfa pellets and bulk animal feed.

The new cars have all the features of



Partial List of Suppliers

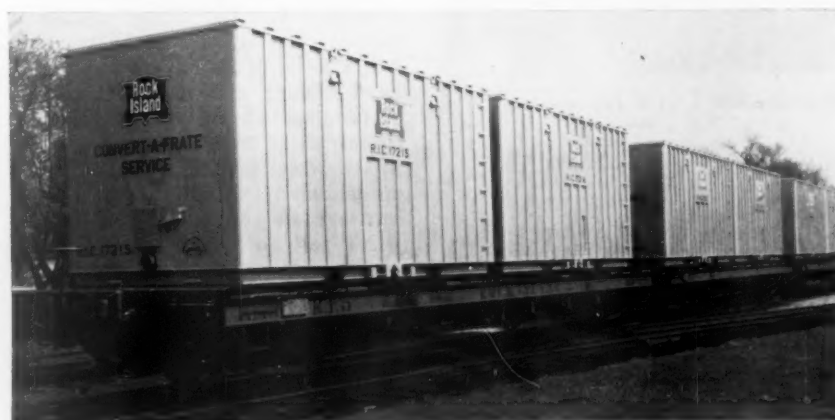
Air brakes	Westinghouse Air Brake	Draft gears (Mark 40)	Cardwell-Westinghouse
Unit brake beams	Buffalo Brake Beam	Couplers	Symington-Wayne
Brake shoes	American Brake Shoe	Coupler yokes	National Malleable & Steel Castings
Hand brakes	Ajax Consolidated	Uncoupling devices	Standard Railway Equipment
Truck bolsters and side frames	American Steel Foundries	Running boards	United States Gypsum
Truck springs	Union Spring & Mfg.	Discharge gates	Pullman-Standard
Axles (6x11) and wheels (1-W)	Bethlehem Steel	Pneumatic outlets	Enterprise Railway Equipment
	United States Steel	Vinyl paint	Pittsburgh Plate Glass
Roller bearings	Timken Roller Bearing		

the standard P-S cars, including all-welded joints without overlapping sheets which keep ladings free of contamination. The 50-deg slopes, the fast unloading discharge gates, and the weather-

tight circular loading hatches are all aids to loading and unloading operations. A newly designed, flatter roof provides a safer platform for workmen. The cars are equipped with roller bearings.

Containers on Rock Island and C&EI

AMERICAN CAR & Foundry Division of ACF Industries, Inc., has built 48 boxes—30 for the Rock Island and 18 for the C&EI—to handle malt and brewers' corn grits for a St. Louis brewery. These 8- by 8- by 17-ft steel portable units have two top-loading hatches and a single unloading port at one end equipped with a hand lever closing device. They will be loaded while on the flat car, transferred to a flat-bed truck trailer at the team rack destination, and driven to the brewery. Unloading is done by tilting the box at a 45-deg angle with a telescopic hydraulic lift on the truck. Contents then flow by gravity and some air pressure to storage bin.



Four-wheel flat cars of Rock Island are now handling bulk malt containers. The boxes are moved on flat-bed trailers at destination.

An additional 20 Convert-a-Frate boxes have been modified by the RI. The RI four-wheel flat cars, tow boxes per car, are used between the Twin Cities, Chicago and St. Louis. The C&EI has

equipped six 58-ft flats to handle three boxes each from Danville to St. Louis. Both roads hope for additional business because the boxes can be adapted to handle any granular, free-flowing material.

Methods for Handling Grain in Bulk

Converted Covered Hoppers on Southern Pacific

MALT SHIPPERS have long wanted to apply the advantages of bulk rail transportation to their product. Equipment of the single-wall type would be at once clean, odor- and vermin-free, and capable of fast, efficient loading and unloading by pneumatic or other means. Early this year, the Southern Pacific redesigned and rebuilt a conventional three-compartment covered hopper car for this purpose at its shop in Los Angeles. Satisfactory service tests led to an order for eight additional cars of a larger size and three cars adapted for malt loading without enlargement. The reason for the two sizes is that the industry has found considerable variation in grades of malt—some of which require cars of greater capacity than others.

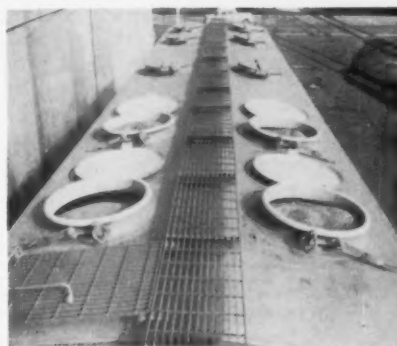
Three primary changes made in enlarging the original Class H70-14 covered hopper car design to adapt it for this special loading included: (1) raising the roof about 12 in. to give a total capacity of 3,000 bushels of grain, the unit generally preferred by breweries; (2) lining the entire interior of the car with a special light blue plastic (Archer-Daniels-Midland 410) to assure maximum protection to the lading; and (3) application of pneumatic outlets and air-control inlets just above each hopper door to permit unloading by suction hose rather than gravity. This operation is facilitated and, in fact, made possible by a hopper bridge conduit shaped of ¼-in. steel, welded longitudinally across each hopper just over the hopper door and having lower edges which clear the door by ⅝ in.

This construction permits gradual flow of the malt grain under the conduit and out through the outlet valve through the suction hose. On the side of each hopper opposite the outlet valve is a manually-controlled air inlet valve set to give the desired rate of grain flow through the outlet valve and suction hose.

The original 70-ton covered hopper car, with a light weight of 61,500 lb and capacity of 2,893 cu ft, is enlarged to have a light weight of 65,100 lb,



Greater capacity was provided in this standard covered hopper by raising roof. Unloading was simplified with new discharge arrangement.



Plastic lining of interior included bottoms of circular hatch covers on this PS-2.

load limit of 144,900 lb and capacity of 3,307 cu ft by raising the roof 12¾-in. The rebuilds are given a new classification, H70-14A. In making this conversion, each car is brought into the Los Angeles steel shop and the roof cut off where it was originally welded to the bulb angles. An electric-arc cutting torch with ¾-in. carbon tip is used. The side sheets, side posts, corner posts and compartment partitions are cut off and an I-beam lifting device applied to the roof which is moved to the shop and placed on wooden horses at a convenient working level.

It is here that 12¾-in. splices or extensions to the side sheets and posts are welded to the roof. The side sheet splices consist of shop-pressed 12¾-in. channel sections welded to the roof and designed to rest on top of the car body bulb angles to which they are subsequently welded. Side and end post extensions are welded in place in the

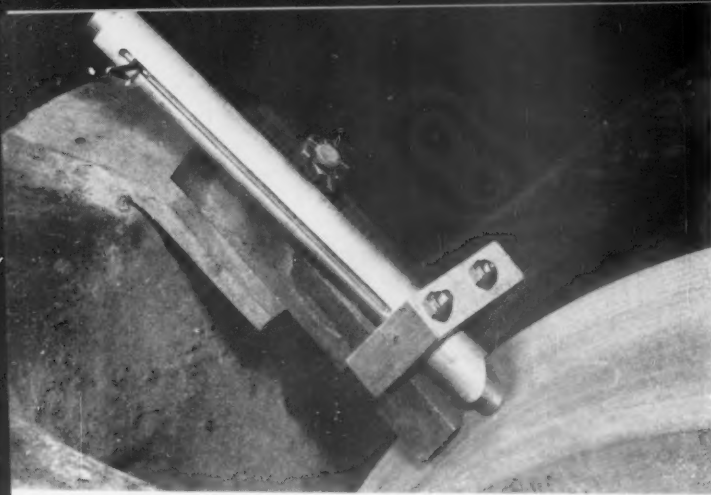


Outlet for pneumatic unloading was applied above conventional covered hopper discharge gate.

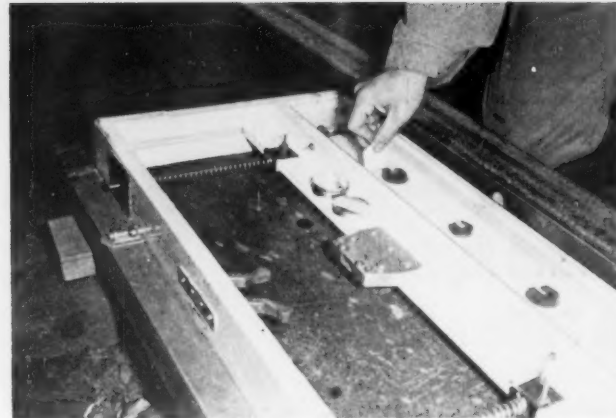
channel sections before reapplication of the roof to the car body.

Work on the car body itself includes applying 12¾-in. extensions to the partitions, installing new end posts and ladder stiles, relocating the brake step, and lengthening the hand brake rod and retainer valve pipe. Hopper bridge conduits are welded in place inside the hoppers and suction outlet valves and inlet air valves installed. The car is then moved to the sand shed where the interior is thoroughly cleaned by sand-blasting, preparatory to spraying with the 410 plastic which assures utmost cleanliness in handling the malt. This plastic not only covers all inside surfaces and crevices, but is applied at all points of possible contact with the grain, including the undersides of the hatch covers.

After exterior painting, stenciling and reweighing, the car is ready for its new service.



Reading diesels got Nalco flange lubricator installations similar to this on wheels at 1, 2, 7 and 8 positions. These "moly" sticks averaged over 2,000 miles of service before replacement was necessary. Reading tests showed good return on flange lubricator investment.



Catch box 32-in. long and 3-in. deep was used for collecting samples. Bottom tray collected metal abraded by locomotive and top tray was then moved into position to collect metal worn by cars. Alnico magnets under plastic trays held all metal particles produced.

Reading's Flange Lubrication Cuts Rail Wear

DIESELIZATION, with greater tonnage, higher axle loads and higher wheel torque, has created a tendency to accelerate rail and flange wear on curves and reduce the life of switch points and frogs. Flange oilers and rail lubricators are accepted methods for reducing this curve wear. Since the advent of rail adhesion studies on the Reading (RL&C, Oct. 1954, p. 86; Jan. 1956, p. 59; Feb. 1957, p. 65), the track condition has been watched constantly.

The Reading rail adhesion study was centered on a grade 35 miles long with 150 major curves and 19 rail lubricators which were located to protect the most severe curves. However, curve rail wear continued to be excessive and observers concluded that rail lubricators were not as effective as they might be.

The development of a rail conditioning compound did not improve the situation. The compound, when sprayed on the rail, covered the heads and sides of the rail. The compound delubricates oil or grease contamination on the rail. From the standpoint of rail adhesion, results were very favorable; but rail wear was accelerated. To obtain information on the amount of curve wear produced by locomotives and cars, tests were conducted on an 11-deg 16-min curve known as Raricks Curve.

The goal of these tests has been to evaluate the amount of rail wear with no lubrication, with rail lubricators using a petroleum-base grease, and with flange lubricators using a dry lubricant. Prior to the tests, it was concluded that some lubricant was almost mandatory but that the material should not impair

rail adhesion. It appeared that a flange lubricator would be the most practical method for applying a dry lubricant to the flange of the wheel, and that molybdenum disulfide might be the lubricant.

Molybdenum disulfide is capable of withstanding high pressures and temperatures, has a high adhesiveness and cohesiveness, and forms a coating over the metal it is protecting from wear. Metal-to-metal contact is eliminated, and the coating has a very low coefficient of friction. "Moly" sticks made

by National Aluminate Company are used.

Test curves on the Catawissa grade showed no shelling and flaking. Since the advent of flange lubrication with the dry, non-propagating lubricant, there was less abrading and curve-wear than with petroleum-base rail lubrication. With improved adhesion, burned rail from wheel slip should be greatly reduced.

Weather conditions and road-bed maintenance add to the many variables
(Continued on page 56)

Average Rail Wear—Grams of Metal Collected in Two 30-in. Trays

	Complete Train Cars and Loco- motive	Com- plete Loco- motive	Per Locomo- tive Unit	Cars	Per Car	Per 1,000 Trailing Tons
11-deg 16-min curve, 0.54 per cent grade						
Test series 1—July to Sept. 1954						
24 trains						
Rail lubricator only (one end of curve) ...	0.19837	0.09425	0.02513	0.10412	0.00083	0.01529
No rail or flange lubrication	0.24800	0.07687	0.02562	0.17112	0.00162	0.02575
Flange lubrication only	0.19350	0.04612	0.01537	0.14737	0.00150	0.02218
Test series 2—Nov. and Dec. 1955						
21 trains						
Rail lubricators only (both ends of curve) ..	0.78520	0.18420	0.06140	0.60100	0.00631	0.09110
No rail or flange lubrication	0.96070	0.17760	0.06124	0.78310	0.00847	0.12753
Test series 3A—Jan. and Feb. 1957						
46 trains—temperature range 12 to 40 F						
New rail						
Rail lubricators only (both ends of curve) ..	0.43621	0.11852	0.03731	0.31768	0.00296	0.04351
No rail or flange lubrication	0.39495	0.10760	0.03294	0.28735	0.00260	0.03647
Flange lubricators only	0.28878	0.05543	0.01687	0.23335	0.00199	0.03257
Test series 4—Feb. and March 1958						
9 trains—temperature range 31 to 40 deg F						
Flange lubricators only	0.17065	0.03783	0.01174	0.13283	0.00120	0.01889
9-deg 3-min curve, 0.78 per cent grade						
Test series 3B—Jan. and Feb. 1957						
36 trains—temperature range 13 to 38 deg F						
No rail or flange lubrication	0.72926	0.19902	0.06143	0.53054	0.00480	0.06805
Flange lubricators only	0.59607	0.14840	0.04535	0.44766	0.00389	0.05702

At Coordinated Mechanical Meetings . . .

New Maintenance Methods Are Emphasized

New Association Officers

Air Brake



L. A. Stanton

President:
L. A. Stanton (GN)
First Vice President:
A. M. Malmgren (SL-SF)
Second Vice President:
F. R. Ellis (Reading)
Third Vice President:
T. Bickerstaff (AT&SF)
Secretary-Treasurer:
J. B. Ball

Car Department Officers



K. H. Carpenter

President:
K. H. Carpenter (DL&W)
First Vice President:
J. F. McMullan (Erie)
Second Vice President:
C. T. Graves (GATX)
Third Vice President:
H. L. Price (AT&SF)
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C. W. Kimball (South.)
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O. L. Hope (MP)
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R. E. Harrison (SP)
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C. M. Lipscomb

Ry. Fuel & Operating Officers



C. R. Patterson

President:
C. R. Patterson (CNR)
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Committee of Coordinated Assns.



T. T. Blickle

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T. T. Blickle (AT&SF)
Members:
J. A. Welsh (IC)
J. H. Heron (GN)
Secretary:
J. D. Ristine

NEW TECHNIQUES which must cut the costs of maintaining locomotives and cars without impairing their ability to move traffic were discussed by the four Coordinated Mechanical Associations meeting in Chicago last month. The Air Brake Association, the Car Department Officers Association, the Locomotive Maintenance Officers Association, and the Railway Fuel and Operating Officers Association participated in the three days of meetings.

Approximately 1,500 railroaders took part in the sessions. This figure, virtually the same as the total for any of the three previous years, emphasized the importance of all these organizations in aiding railroad men to control costs and improve their operations. About 700 supply representatives, and 500 ladies and guests were also registered at the 1958 meetings. This was the fiftieth such session held by the Air Brake Association.

Locomotive Problems

T. T. Blickle, general manager—mechanical department, Santa Fe, summarized the problems confronting supervisors responsible for today's diesel locomotives. "The majority of the problems that we encountered while going through the dieselization process are quite different than the major problems we are facing today," he said. "There have been tremendous increases in labor and materials costs and every indication is that they will go higher . . . As locomotives get older it is quite apparent that they will require additional work to keep them in proper condition."

"We must maintain our motive power in suitable condition to protect the service," Mr. Blickle went on. "It is going to be necessary to find additional ways of saving manhours and materials. We must take a new look at maintenance schedules to determine where we are over-maintaining and where lack of maintenance may be causing increased expense. We must also take a new look at our shop practices to determine where further efficiency can be obtained. We must learn to work with smaller inventories."

"As a result of complete dieselization and fluctuations in business, in many instances there are excesses of diesel power which means that it is more difficult to maintain good utilization." This necessitates storing locomotives

with consequent expense and problems.

"Obsolescence is catching up with quite a few diesel locomotives and has now reached a stage where it has become necessary to give consideration to the modernization of existing equipment or the purchase of replacements; and also to what should be done about providing a fleet of stand-by locomotives to take care of peak movements."

"The new ICC rules will be more restrictive than those in the past," Mr. Blickle continued, "and will also cause an additional financial burden—both from the standpoint of design changes and from increased inspection. It is important that all employees who have to do with locomotive maintenance become fully familiar with these new rules and their proper interpretation and application."

"Later Than You Think"

A shipper's views on cars and car supply were given to the Car Department Officers by L. L. Adams, assistant to vice president—traffic, U. S. Steel. He quoted a recent statement by PRR vice president D. C. Bevan, who predicted that an appreciable upturn in business will bring about the worst car shortage in history due to the virtual elimination of car repair programs and inadequate capital for the purchase of new equipment. Discussing the current and future car requirements of the steel industry, Mr. Adams said, "Please get your cars repaired, upgraded, and ready to roll! It is later than you think."

"If and when car shortages return," Mr. Adams continued, "the familiar unfortunate pattern of the past may be expected. Initially 65-ft gondolas will become scarce; next wood-floor gondolas; then box cars. Soon thereafter, a shortage of practically all types of cars will be experienced."

"It is hoped that progress can be made toward programming car construction so as to avoid the historical peaks-and-valleys situation that has resulted in cars being ordered only when demand for them is already upon us, with the deliveries coming after peaks of demand have passed. Relatively few freight cars are being repaired or upgraded . . . Again it is feared that railroads will be too late in getting repair facilities going and too late in ordering repair material."

"Currently we are experiencing dif-

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difficulty in obtaining adequate supplies of covered gondolas, other than coil cars, which suggests this type of car should be given prominence in railroad car construction programs . . . Standardization of freight car design has obvious economic advantages. Care should be exercised to avoid standards that fail to take into consideration the varying needs of commerce for cars of different sizes, clearances, and load-carrying equipment.

"The steel industry has recommended that 50 per cent of all new gondolas be wood floored. This is an area where by furnishing the shipper the right car, the railroads can be more competitive with other forms of transportation . . . We seem to be quite unable to get railroads to understand that we need to have drop ends (of drop-end gondolas)

in place and operative; otherwise we would ask for fixed-end cars.

"For the longer range . . . the practicability of 75- or 80- ft gondolas should be studied. The 90-ton truck should be put under more gondola and hopper cars. There are many new design features for box cars available that offer much of value—wider door openings, interior fittings, flat cushion-type bulkheads in ends, to name a few . . . All cars should be on effectively snubbed trucks and should have built-in devices to absorb impact. These things are fundamental if rail freight is to go through on a competitive basis . . . To make real advances in solving any of these problems, we believe something must be done to make per diem charges more realistic. Modern data processing equipment could make this possible."

L.M.O.A.

Diesel Parts Cleaning

One of the large eastern railroads has placed the formulation of policy, with respect to product, usage and purchase under the jurisdiction of trained personnel of the technical research department. The program that developed and the controls that resulted have accounted for sizeable savings.

The policy in effect on this railroad results in placing cleaners in specific groups or classes with numerical designation. Cleaners are not held to rigid specification, but are required to meet a standard performance specification. Cleaning materials tested for alkaline are first checked for chemical composition and if within the average contents of the accepted materials of the same class, the material is given a performance trial under actual usage conditions. If the cleaning material meets all requirements, it is then placed in the proper category and listed as an accepted product. This results in from four to five different materials being carried in any one classification, each suitable for performing the same cleaning work. Using forces order by class number rather than product name. The purchasing agent will obtain the material covered by the classification from either the supplier nearest to the using point or the company under contract.

At least once each year the consumption of cleaning materials for the previous year is reviewed. If a material through field checks does not maintain its performance or if price has been subjected to undue changes, a reevaluation is made of the

material. When it is determined how much cleaning material can be purchased from each supplier, a contract is entered into which is guaranteed minimum per year, permits obtaining cleaning materials on car load prices regardless of the quantities in which the materials may be purchased.

To assure correct usage of cleaning materials it is the practice to classify materials by their basic types and to designate areas of application. Unless this, or similar control is exercised, the application of a specific cleaning material can result in excessive waste. To illustrate the areas of correct usage of cleaning materials a chart showing suggested classification, their uses for basic cleaning materials is presented. This chart will serve as a basic guide for either large or small operations.

To reduce man-hours one of the large western railroads has extensively revised maintenance shop procedure to permit a centralization of the cleaning operations. The layout of the diesel parts cleaning by this railroad was integrated into engine stripping, inspection and reconditioning operations to obtain an over-all assembly line type of operation. Considerable planning has resulted in maintaining to an absolute minimum the labor necessary for diesel parts cleaning and parts handling. It has reduced the distance required for parts to be handled when performing various cleaning operations.

The removal of dirt, scale and lubricants from wheels is being given greater emphasis by inspectors. The 1957 report covered an automatic wheel cleaning device well suited to a production shop where wheel cleaning volume can justify costs of such equipment.

Agitation Required

To simply place pistons, valves, cylinder heads, engine frames in a boiling solution of cleaning material does not produce a satisfactory degree of cleaning. The addition of mechanical action is necessary, except for the loose, easily removable soil. Agitating machines are finding much wider application for the cleaning of diesel components. An agitating type cleaning machine reduces the manpower required, reduces the interval to obtain satisfactory cleaning, and in addition, saves on the amount of cleaning materials required to do the job.

One manufacturer of agitating types of cleaning machines now offers a range of such machines to cover the smallest requirement to the largest requirement encountered in cleaning diesel engine components. Machines are available ranging from 30 gal of cleaning solution, with a 75-lb work load, to a machine that will handle a complete engine block or truck frame, with a capacity of 18,800 gal of cleaning solution and a work load of 13,500 lb.

For electrical rotating equipment, to obtain efficiencies over solvent spraying or dipping of such parts, the vapor degreaser method of cleaning presents an attractive opportunity for economy. In addition to electrical equipment, many diesel components can satisfactorily and economically be cleaned by this method. This applies to smaller parts that do not have hard, burned, carbon deposits. One railroad has installed a shop designed and fabricated vapor degreaser which will handle a work load of 14,000 lb per hour. A vapor degreaser is utilized for cleaning all electrical rotating equipment and in addition fans, blowers, journal boxes, wheel and axle sets, cylinder liners, rods and many smaller diesel engine parts not subject to burned and hardened carbon deposits.

Certain diesel components, particularly the cylinder heads, liners, pistons and valves present a special cleaning problem which require hand or motor driven wire brush removal of hard carbon deposits. The cylinder head areas such as burned carbon around exhaust valve ports and also hard scale in the water contact areas are expensive to clean by the manual method. To economically clean the hard deposits remaining after normal hot tank cleaning of loose soil, cylinder heads are economically cleaned by a suction fed dry blast machine described in the 1957 report.

The same type cleaning applied to other diesel parts subject to hard carbon deposits prove the most economical method to employ. The valve cleaning machine so described in the 1957 report produces completely cleaned valves at the rate of one valve each 15 sec or 240 valves per hr. The type production machines described in the 1957 report can be justified in the high volume, centralized repair shop, but if economies are to be realized for smaller operations, this type cleaning must be obtained on a modified basis within justifiable cost limits.

In checking with the manufacturer of

this machine, one railroad determined that a standard production model could be economically used for valve cleaning. This blast type cleaning machine produced an absolutely clean valve at the average rate of one every three minutes or 20 pr hr. The machine adapted to valve cleaning operations is a hydro-finish liquid blast cleaning cabinet consisting of a water-tight cabinet provided with hopper tank for mixing, storing and re-collecting the blasting solution, utilizing finely ground quartz crystals. This solution, known as slurry, is ejected against the parts to be cleaned by air pressure. An operator directs the flow against the part to be cleaned. The resultant cleaning action is a scouring effect which removes the hardest deposits from metal without any harmful effects on the metal part itself.

Cleaning Oil Cleaners

The higher-horsepower-per-cylinder engines have placed a heavier burden on the lube-oil system. The use of fuels having a slower burning rate (lower octane number) has increased the contaminants in the lube oil. Data assembled by various members of the Fuel and Lube Oil Committee indicates that the Alco 244 engine oil cooler can hold from 60 to 85 lb of sludge, while an EMD oil cooler can hold as much as 45 lb of sludge.

Some railroads are using a machine incorporating a high-capacity pump for the cleaning solution and a tank with heating coils. Probably the most satisfactory pump to use is an EMD water pump, electrically driven by a 5-hp, 750-rpm motor. The pump should be connected to a 100-gal tank by a standard flexible connection, or a 2½-in. pipe and Dresser coupling. A 25-ft, 2½-in. inside diameter hose with suitable fittings for a pressure line to the oil cooler and another similar hose for a return to the cleaner tank are needed. Some railroads use a cleaner requiring heat, so heater coils are provided in the tank. The tanks are also equipped with an overflow pipe and a drain valve. This complete assembly is mounted on wheels so that the device is transportable.

Depending on the condition of the lube-oil cooler, it may require from 3 to 6 hr to clean the oil cooler. This includes the time necessary to back-flush the oil cooler and is particularly advisable when cleaning the Alco type cooler. This is necessary in order to remove the deposits on both sides of the tubes in the cooler. On EMD type coolers, back-flushing is not practical because of the baffle on the discharge side of the cooler.

After the cleaning operation is completed, the lube-oil cooler and related piping should be blown with air and flushed with lube oil or flushing oil to remove any trace of the cleaning agent. Caution should also be taken that the cleaning agent will not attack any of the metals in the lube-oil system being flushed.

A lube-oil cooler on a GP-7 locomotive was cleaned by using the above method. First, the core was removed,

weighed and replaced. After a cleaning operation of 4 hr, the cooler core was again removed and found to be clean. The core had lost 12 lb of dirt or sludge. A similar operation on an Alco road-switch locomotive removed 20 lb of sludge.

Temperature readings taken on load test of GP-7 and GP-9 locomotives show cleaning of oil cooler reduces oil temperature from 30 to 50 deg.

Heat rejection in the lube-oil cooler should be about 15 deg F in an EMD

F-7 or F-9 engine with a clean oil cooler. If the difference between oil temperature into and out of the cooler is less than 10 deg F, the oil cooler has sludge deposits. It is important from the standpoint of maintaining good oil condition to keep lube-oil temperatures within the 220-deg F range. The deterioration (oxidation) rate doubles with each 10 deg F rise above 220 deg F. In other words, the oil temperature should not exceed this figure for best lube-oil performance.

A Suggested Classification and Use Chart For Basic Cleaning Requirements - Diesel Locomotives

Classification	Material	Solution Strength	Authorized Uses
Hot Tank Cleaner Heavy Duty	Highly Alkaline Detergent Type Powdered Compound	4 to 8 Ounces Per Gallon of Water	1. Hot soak tank cleaning and degreasing of diesel locomotive engine parts made of iron or steel only. 2. Hot soak tank cleaning of large parts such as gear cases, etc. 3. Cleaning panel type air intake filters.
Hot Tank Cleaner Medium Duty	Inhibited Alkaline Detergent Type Powdered Compound	4 to 8 Ounces Per Gallon of Water	1. Hot tank cleaning of aluminum and other soft metal parts from diesel locomotive engines.
Cold Spray Cleaner Light to Medium Duty	Mild Alkaline or Mild Acid Detergent Type Powdered Compound	A. 5 ounces per gallon of water B. 4 ounces per gallon of water C. 3 ounces per gallon of water	1. Cleaning road diesel exteriors with Whiting washer solution strength B 2. Cleaning road or switch diesel exteriors by hand, solution strength A 3. Cleaning diesel trucks, solution strength A 4. Cleaning cab and engine room interiors, solution strength C
Cold Spray or Cold Vat Cleaner Medium to Heavy Duty	Oil and Grease Solvent and Emul- sifier - Liquid Type	A. 1 part to 3 parts of water B. 1 part to 3 parts of diesel fuel C. 1 part to 5 parts of diesel fuel D. 1 part to 5 parts of water	1. Maintenance cleaning of trucks, underframes, and tanks under locomotive, solution strength A 2. Maintenance cleaning diesel engine top deck, air box, crankcase, and "A" frame, solution strength C 3. Maintenance cleaning of bull gears and wheels in vat, solution strength B 4. Maintenance cleaning diesel cabs and engine rooms, solution strength D
Steam Cleaners Light to Heavy Duty	I-High to Medium Alkaline Detergent Type Powdered Compound II-Light to Medium Alkaline Detergent Type Powdered Compound	4 ounces per gallon of water	1. Heavy duty maintenance steam cleaning of all types, use "I" in hypressure Jenny or similar equipment. 2. Light and medium duty steam cleaning with hypressure Jenny or equivalent equipment, use "II" varying solution strength from 2 to 4 ounces per gallon of water according to requirements.
Scale Removers	Inhibited Inorganic Liquid Acid or Organic Powdered Acid	Liquid Acid: A. 1 part to 4 parts of water Powdered Acid: A. As directed by manufacturer	1. Removing scale from interior of coils of steam generators. 2. Descaling diesel water radiators.
Electrical Parts Cleaner	Inhibited Organic Solvents	Use full strength as received. Do not Dilute	1. For general cleaning of locomotive electrical equipment, to include cabinets, generators, traction motors, and accessory equipment. Spray or wipe.
Vapor Degreasing	Trichlorethylene or Perchlorethylene	Use full strength as received. Do not Dilute	For vapor removal of oil, grease and foreign matter from selected diesel parts in special tank equipment, produced or purchased for this type of cleaning.

Extension of Diesel Maintenance Intervals

One possibility for reducing costs is to extend the intervals between maintenance operations.

Modernization of the Alco 244 engine on railroads represented by this committee has resulted in a considerable increase in time between power assembly overhauls. The use of serrated main bearing caps, hardened crankshafts and semi-grooveless bearings has eliminated the requirement of bearing inspections formerly made at six months or annually. This can be extended in the case of connecting rod bearings to the time of assembly removal.

Inspection of the center main bearing formerly at 90-day intervals, six-month intervals and at the time of annual inspection, the committee believes, can also be extended to the assembly changeout period.

Where the Ni-Resist piston ring carriers are used, it is the New York Central's experience that in heavy freight service the overhauling of the cylinder assemblies can be extended to 30 months, provided unplated cylinder liners are used in combination with the chrome plated top ring. The ring should have at least .007 in. to .008 in. chrome thickness on the ring face. Very limited experience with chrome plated liners in 244 engines indicates that it will not be possible to extend cylinder assembly overhaul where cast iron rings

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are used in combination with chrome plated liners as top ring wear in 24 months has caused ring gap to be as much as .209 in.

Side wear on piston rings where the Ni-Resist insert is used has proved to be within reasonable limits. However, we may find, in the future, that a thin flashing of chrome plating may be advantageous on the ring sides. Some roads have excellent results using Ni-Resist ring carriers with cast iron rings in chrome plated liners, reporting no excessive ring wear after two years use in passenger service. The pistons with Ni-Resist ring carriers in all cases reported are in such condition that they are re-installed for an additional two years service.

It has been found where properly overhauled and calibrated fuel injection pumps are used that it is no longer necessary to change out the pumps on a mileage or time basis. They will operate satisfactorily to the cylinder assembly changeout date. A portable fuel injection pump and nozzle tester has recently been developed that allows testing of the fuel injection pump and nozzle for leaks and the nozzle for proper popping without their removal from the engine.

Some roads have found it possible to operate traction motors in road service up to 500,000 miles without overhaul through the use of modern insulating materials and greases.

The committee feels that on switch units it will be satisfactory to eliminate from a tier or mileage inspection such overhaul of the following items: traction motors, main generators, engine blowers, superchargers and auxiliary generators. If these items were overhauled only when defective, considerable saving could be realized. On switching power it has been found that considerable saving can be made by overhauling cylinder assemblies only when conditions indicate assemblies are badly worn or otherwise defective.

EMD Engines

EMD in their M.I. 1704 issued October 1957 extended lead readings on EMD diesel engines to 120,000 miles in freight service, 250,000 miles passenger or one year. Some roads represented on this committee takes lead readings on a three to six months' basis on road power until two years service has been received from the assemblies. The lead readings are taken monthly until power assemblies are renewed, to insure that no excessive wear exists in compression washer, wrist pin bushings or connecting rod bearings.

One railroad discontinued the cleaning of air boxes on EMD engines about 2½ years ago. They experienced a reduction in piston seizures and scored liners. Air boxes are not cleaned except at time of power assembly renewal. This item deserves further investigation as a small sav-

ing can be made at time of each monthly inspection if we find cleaning of air boxes is not necessary.

Most railroads change out cooling water and lube oil hose on an annual basis to prevent failures and possible personal injuries. It has been found that the use of Dresser couplings in place of hose has eliminated the necessity of any kind of inspection and materially reduces failures.

15-Day Inspections

It has been found that with proper monthly inspection and maintenance on road freight and road switch power that most of the items, formerly performed on a 15-day basis, can be eliminated and those that experience indicates are required can be accomplished in a very short time at fueling stations or turnaround points. The following items should be handled on a 15-day basis:

On Alco power, clean lube oil strainers, renew lube oil filters, change or clean and oil engine air intake filters.

On EMD power, change out lubricating oil filters, change or clean and oil engine

air intake filters, check oil level in support bearings and check lubricant in traction motor gear cases.

567-C Engine

It is generally accepted that the life of the EMD 567-A or B power assembly is limited, not so much to piston ring and liner wear but to worn compression or thrust washers and wrist pin bushings resulting in high lead readings; or to water leaks.

In designing the 567-C engine the manufacturer has provided a very strong piston carrier, heavier and longer life compression washer and provided considerably more bearing area in the piston pin, however, lubrication seems to need improvement. It therefore, appears to the committee that if the manufacturer further improves the piston and liner assembly so that life comparable with 567-A or B engine can be obtained from cylinder liners and rings, cylinder assembly change-out could be extended six months or possibly one year longer than the older type engines. Water leaks should not be factor in "C" engine cylinder assembly life.

The manufacturer has improved the lower liner seal to eliminate pressurizing crankcase and reduce oil leaks at rear main bearing and top deck.

Diesel Storage Presents New Problems

This subject is controversial. The method used depends largely on the facilities available. Because diesels have not been stored the length of time necessary to determine the best procedure several methods are reported.

One railroad uses this procedure: Drain engine and compressor lubricating oil and refill. Bring concentration of engine water cooling system inhibitor to three ounces per gallon. Run engine at idle for one-half hour. Shut fuel pump off and allow engine to run itself out of fuel. Open main battery switch.

Make notation on engine shut down tag that water has been drained and main battery switch has been opened for purpose of storage. Show date stored and post this tag near start button.

Drain all air lines and otherwise protect unit against freezing. Considering location of storage point, provide adequate protection against damage from deterioration due to snow, ice, water, and dust. If hand brake is located within cab or body, it is to be set when stored. Make notation of this at each corner of unit.

Protect unit from trespassers, pilferage, fire, runaway, and collision. Take gravity readings semi-monthly and if hydrometer reading is below 1200, apply trickle charger to bring reading above that minimum to prevent sulphating of batteries.

A second road advises: Remove stor-

age batteries and store so that batteries can be properly taken care of while out of locomotive. Thoroughly drain water from engine and cooling system, also water pumps and cab heaters and water storage tanks.

Drain lube oil from engine. Pump Tec-toyl compound through lubricating system of engine. Remove oil from journal boxes and completely fill box with Tectoyl then move unit so as to work the compound thoroughly into roller bearings and cage. If stored outside, the exhaust stack should be covered. Set hand brakes and chock wheels.

A third road reports that it is generally known the diesel locomotive deteriorated very rapidly when not being used. It suggested rotating locomotives progressively on a schedule where the batteries will not require external changing, etc. And, also, during the off seasons it makes an ideal time for heavy repairs to be made.

Where the rotating of locomotives cannot be made steam should be connected to the engine cooling system to prevent expansion and contraction of the engine from developing water leaks. The batteries should be placed on charge to prevent plates from sulphating. If these facilities are not available the engine should be started every two or three days and idled for at least an hour or two.

With these practices in force, locomotives could be stored for 30 days and then exchanged with the same number of locomotives in service. If neither of these suggestions are adaptable, the batteries should be removed and placed in battery

shop where they can receive proper attention. The engine cooling lubrication and fuel systems should be drained and pumped full of Tectoyl compound as outlined in manufacturers' general service bulletin.

A fourth road reports instructions governing the storage of diesel locomotives temporarily, not exceeding 30 days. Where steam is available, locomotive will be stored in house with no other precautions other than connecting a heat exchanger during winter period. The cooling water temperature can be maintained at 140 deg by use of steam at 60 lb pressure. The steam to be piped through the coil with cooling water in the jacket and this application to require one heat exchanger and one steam trap with steam line on each diesel engine stored.

Locomotives in such temporary storage in house will have the diesel engine started each week and allowed to operate two to three hours to re-charge batteries and at the same time circulate fuel oil and lubricating oil. These locomotives will also be moved three wheel revolutions each 30 days to prevent roller bearing from etching.

The same road reports instructions for

temporary storage of diesel locomotives not exceeding 30 days where steam heat is not available. Under this they report laboratory is to make an analysis of lubricating oil to determine if it is in good condition and can remain in crankcase. If analysis shows oil to be detrimental it should be drained and refilled. Bring concentration of engine water cooling system inhibitor to three ounces per gallon. Run engine idle for one-half hour. Drain cooling water. Open main battery switch. Make notation on engine shut down tag that water has been drained and main battery switch has been opened for storage purposes and post this tag near start button. Show date stored. Drain all air lines and otherwise protect unit against freezing.

Take gravity readings semi-monthly and if hydrometer reading is below 1200 apply trickle charger to bring reading above that minimum to prevent sulphating of batteries. Each three weeks move engine back and forth three wheel revolutions to prevent etching of journals.

Under storage in excess of 30 days when units are not parked on steam inside of house this road suggests following manufacturers' bulletin on storage of locomotives.

and five others are soon to be applied. One operated almost 8,200 hr before repairs were needed. Most of the hydraulic starter defects have been the failures of hydraulic seal rings.

The Committee suggested that battery charging voltage regulators be relocated so the contacts are unaffected by impact. Pacific Fruit Express is now using nickel cadmium batteries to replace lead-acid batteries. Advantages claimed are need for less water, greater resistance to low temperatures, and better cold-weather starting characteristics. However, the Committee continued, "Due to increased cost of the nickel cadmium batteries, service beyond the 10-year guarantee will be needed to offset the cost." Alternators without brushes are now being applied to new PFE cars. This should solve some of the troubles with stuck brushes and consequent burning of the commutators and slip rings.

Expendable Parts for Mechanical Reefers

Car owner and Equipment	Replaceable Element Mfr. and part no.	Diam. in.	Lgth. in.
Primary Fuel Filter Cartridge			
MDT			
Detroit 2044A	DD 5192854	3	5
BRE-FGE-WFE			
Detroit 2044 and 2044A	CFC 10R6	2 1/2	6
SFRD			
Detroit 3044A	DD 5573264	2 1/2	8
Secondary Fuel Filter Cartridge			
MDT			
Detroit 2044A	DD 5573264	2 1/2	8
BRE-FGE-WFE			
Detroit 2043B	CFC 19X4-2V	2 3/4	4
Detroit 2044 and 2044A	CFC 19X8-2V	2 3/4	8
SFRD			
Detroit 3044A	DD 5192854	3	5 1/2
Lube Oil Filter Cartridge			
MDT			
Detroit 2044A	DD 5572425	4 1/2	8
BRE-FGE-WFE			
Detroit 2043B, 2044 and 2044A	AC P117	4 1/2	8
SFRD			
Detroit 3044A	DD 5572425	4 1/2	8
Dryer Cartridge			
MDT			
Frigidaire	Frig. 5911747	2 1/4	11
BRE-FGE-WFE			
Frigidaire All-purpose	Frig. 5911747*	2 1/4	11
SFRD			
Trane All-purpose	Trane DHY-803		

*1/2-in. flarenut connection
CFC—Commercial Filters Corp.; DD—Detroit Diesel; Frig.—Frigidaire

C.D.O.A.

Mechanical Reefer Fleet Continues to Grow

A total of 3,511 mechanical refrigerator cars were in service on US and Canadian railroads on June 17, 1958. The CDOA Committee on Maintenance and Servicing of these cars discussed some of the difficulties associated with their operation and suggested a list of tools and supplies which would be necessary for servicing and maintenance.

"Extensive" troubles with batteries, battery charging equipment and electric starters have led the Committee to recommend further work with hydraulic starters. Two of these devices are available—Hydro-starter made by Aero Division of General Motors and Hydrotor made by American Bosch Arma. Two Hydro-starters have been on test for some time

Tools for Servicing and Maintaining Mechanical Refrigerator Cars

Tools for Trouble Shooting

- 1—Refrigeration gage test manifold complete with gages and valve handles
- 1—6-ft flexible refrigerant charging line
- 3—3-ft flexible refrigerant charging lines
- 1—Temperature meter with 15-ft Thermocouple
- 2—Thermometers, 50- to 120-deg range
- 1—Prestolite leak detector for Freon 12
- 1—Copperhead
- 1—Ammeter, 50 amp and 250 volts
- 1—Frequency meter
- 1—Oil charging pump
- 1—Set of wrenches for valve stems including ratchet for use with sockets; valve stem sockets in following sizes—3/16-, 1/4-, 5/16-, 1/2- and 7/16-in. sizes, and 21/64 x 15/32-in. packing-nut socket.

Tools for Pre-Trip and Subsequent Inspections

- 1—Flarenut wrench 3/4 x 1-in.
- 1—Flarenut wrench 7/8 x 1 1/8-in.
- 1—Battery hydrometer
- 1—Anti-freeze hydrometer
- 1—Injector timing tool for Detroit diesels
- 1—Injector lifting tool for Detroit diesels
- 1—Valve lash gage
- 1—Slack tube Manometer
- 1—Vacuum Pump

Refrigeration Control

After experimenting with various defrosting arrangements, the Committee reports that "it is fairly well accepted that the air-pressure differential switch is the best way to initiate defrosting," and that the best way to terminate the process is with a device which measures the temperature of the evaporator coil. The characteristics of such termination thermostats or thermal switches change with age. The Committee also warns that these devices should be located so that impact does not affect their contacts.

Warning that moisture cannot be tolerated in a refrigeration system, that Committee asked that increased attention be given to moisture indicators. Two of these devices are the Ansul Dri-Eye and the Sporlan Moisture Indicator. There have been some bad experiences with moisture indicators, but some of these troubles have been solved.

Another accessory which has been used with some installations is the quick-disconnect, self-sealing coupling. Where components are arranged for quick change-outs, this coupling has a place. On refrigerator cars, it has been used in the fuel lines. Some work has been done with it in the refrigerant line, but the device has tended to leak at the threaded joints.

Coordinated Mechanical Association Meetings

The Vapor Heating Corporation thermostat panel now includes an "Alls Wellite" pilot. On the newest PFE cars, it is mounted 16 in. below the running board on the car end and gives off a violet light visible 200 to 300 ft if the temperature is

within plus or minus 5 deg of the thermostat setting. This should speed up train-yard inspections.

The Committee warned failures of pilot lights have frequently caused trouble, but this device is a fail-safe arrangement.

Hot Box Problems Are Not Solved

THE "DISAPPOINTING" hot box performance in 1957 as compared with 1956 was mentioned by the CDOA Committee on Car Lubrication in discussing the problems of freight car journal lubrication and performance. "It can be expected that the hot box situation will become increasingly more critical as a result of reduced maintenance and servicing forces," concluded the Committee. "It would seem that one of two decisions must be made. Either accelerate the rate that loose waste is eliminated, or increase servicing forces to obtain the maximum serviceability from cars lubricated with loose waste."

Looking ahead, the Committee forecasts the following developments:

- Better lubricating pads with greater durability, wicking, and oil retention.
- New developments in dust guards

and oil seals.

- New designs of axle and journal stops.
- Changes in bearings and wedges to give better load distribution with some control over journal movement.
- Changes in journal oil and its application.
- Increased interest in rules dealing with inspection, maintenance and servicing of cars lubricated with lubricating devices, and in the maintenance of trucks.

Steps "beyond acceptance of lubricating pads involve considerable additional money outlay," warned the Committee. "Lubricator pads complete with developments considered necessary for an improved journal box assembly add up to a sum unlikely to be expended in the light of present economic conditions. The best compromise would require a wise investment in pads

and improvements related to better performance of the pads."

Roller Bearings

The 40,000 sets of freight car roller bearings in service are giving a performance which is "very encouraging", according to the committee, and the number of applications should grow. The committee cited a series of features of these bearings worthy of note:

- All bearings are interchangeable on standard roller bearing axles, and the assemblies are interchangeable in a variety of truck side frames.
- Bearings are assembled, adjusted, lubricated and packaged to avoid damage or contamination.
- Some bearings are so designed that no unauthorized personnel can gain access to the bearing and all necessary work is sent to shops with special facilities for inspection, reassembly and lubrication. "Precision parts do merit this attention," according to the Committee.

In servicing, these bearings should not be lubricated with too much grease, the Committee warned. Checks of bearing temperature should be made by feeling the adapter and not the bearing housing. The Committee called attention to the fact that roller-bearing wheel sets cannot be stored on staggered wheel tracks, as is done with standard wheel assemblies.

(Continued on page 36)

Car Officers Recommended These Interchange Rule Changes

Rule 3, Section 1

Eliminate Paragraph 3-b because side frames of these types should not be used in interchange. Modify Paragraph 3-c for the same reason to read "Brake hanger brackets, repairs or renewals, may be performed as outlined under Section B of Rule 23."

Rule 4, Section f

Modified Paragraph 3 to eliminate reference to cars with lading tie-down anchors and make the figure read "2½ in. measured in any direction" on all cars to permit application of tie rods or cables on cars with strap anchors.

Rule 4, Section 1

Interpretation 3 modified to eliminate material beginning "car owner . . ." and substitute "joint inspection should be made in the manner prescribed in Section k".

Rule 9

Modification of section on "Wheels and Axles, R and R" (bottom of page 44) to add "or flood damage". Modification of section on "Draft Gears" to require "When secondhand gears are applied, show date of manufacture and date reconditioned".

Rule 17, Section i

Modification of Paragraph 4 to require that if "new or secondhand nonapproved" gear is applied, charge should be confined to "scrap" value. Rule 101 does not indicate secondhand value.

Rule 17, Sections n and o

Modification of Paragraph 1 to require that

"Built-in stabilizing devices, lateral motion devices, or provision for long spring travel must be maintained where standard to car", in accord with generally accepted practices and to maintain owner's standard. Similar change in Rule 88.

Rule 17, Section 1

Modification of Interpretation A-3 to read "Defect card is required for labor only to correct such wrong repairs", because Rule 3 permits only certain types of retainer valves.

Rule 32

Paragraph 10-k modified to read "Center sills warped, sagged, buckled, or bent to any extent vertically or horizontally between body bolsters, where there is evidence of direct flame having been applied to facilitate unloading". Paragraph 12-b modified to read "for defect card to road responsible. Joint Inspection Certificate must indicate whether or not car can be restored to same condition by cleaning as existed prior to contamination. Few roads avail themselves of opportunity to inspect contaminated cars and they do not share in loss of per diem brought about by damage to cars. This would expedite repairs.

Rule 36

Modify Paragraph 1 by eliminating "Delivering Company Responsible" and brackets. Paragraph 13 modified by adding "for any violations of ICC regulations". Interpretation 6 would be changed to eliminate issuance of defect cards for removal of placards on cars other than those subject to ICC regulations. Similar change in Rule 107—Item 105.

Rule 60, Section k

Addition of new Note 1 reading "Periodic cleaning of Universal and D-22 types of brake equipment on freight cars shall be governed by the time limits provided in Passenger Car Rule 7". Both types of valves are in use in freight service.

Rule 60, Section 1

Eliminate Note 1, because these portions are no longer in service.

Rule 61, Section a

Paragraph 2 modified to eliminate requirement that truck should be removed because this is too much work to be done free of charge. Addition of new paragraph 4 was made to encourage in-date testing of cars while on repair tracks by permitting charge for testing and stenciling.

Rule 107

Recommended that labor charges in terms of hours be resumed because supervisors use these figures to measure productivity. In addition, frequent changes in hourly rates make it necessary to check each item for date and charge applicable on that date.

Rule 111

Recommended that Item 28 Note 1 be modified to permit charge for both material and labor. New section added reading "Slack adjuster, automatic, cleaning, oiled, and repaired, including any necessary material, except renewal of body or frame, average charge each". This is the same as passenger car Rule 21.

Stocking too many brush grades?



NATIONAL stopped this brush mix-up
with one all-purpose brush grade!



C. F. EISELE

This railroad used a number of different brush grades of the same size on similar auxiliary motors of its freight units, says "National" Carbon Brush Man, Chuck Eisele.

Stocking the various grades was problem enough. Much worse was the danger of mix-ups — outfitting motors with the wrong brush grades.

By carefully analyzing work loads, Chuck Eisele was

able to recommend one "National" brush grade to handle all auxiliary motors. The mix-up and stocking problems were solved completely.

Solving brush problems is a specialty of "National" Carbon Brush Men serving the nation's railroads. The men's training, backed by National Carbon long term brush development, make them your best consultants.

Call your National Carbon Brush Man or write to National Carbon Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

"National", "N" and Shield Device, and "Union Carbide" are registered trade-marks of Union Carbide Corporation

NATIONAL CARBON COMPANY • Division of Union Carbide Corporation • 30 East 42nd Street, New York 17, N. Y.

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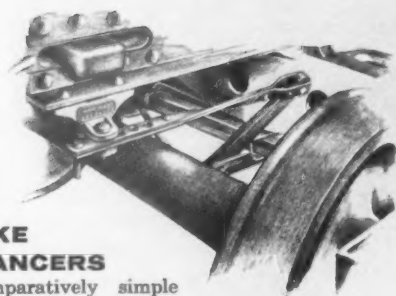
Since 1912

LEADERS IN RAILWAY APPLIANCE PROGRESS

Experienced in Design and Manufacturing of Specialized Products

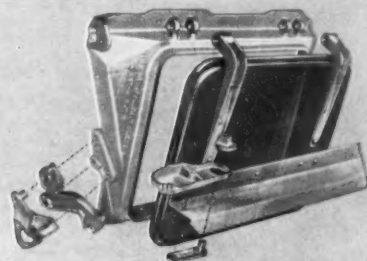
The nation's railroads are noted for many great transportation achievements . . . one of the most important being the efficient handling of the country's heavy bulk freight.

Since 1912, The Wine Railway Appliance Company has designed and manufactured many of the important parts of hopper, gondola, flat and box cars that make this handling function possible, as well as profitable, for the owners and users of the cars. In the years ahead, Wine will continue, through its experience, engineering know-how, and manufacturing skills, to keep pace with the needs of the railway industry.



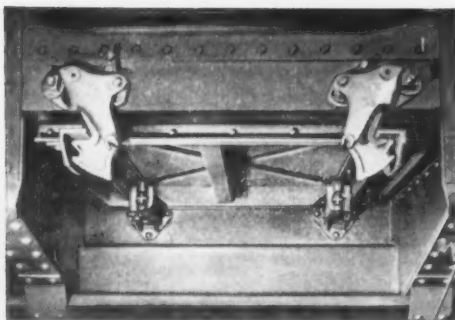
BRAKE BALANCERS

A comparatively simple method of equalizing forces and "balancing" the conventional brake arrangement by replacing the dead lever connection to the truck bolster with the Wine Balancer—connected to the car underframe. A bracket and connector at each end of the center sill flange, engaging the dead lever, balances the brake forces by returning them to the underframe of the car.



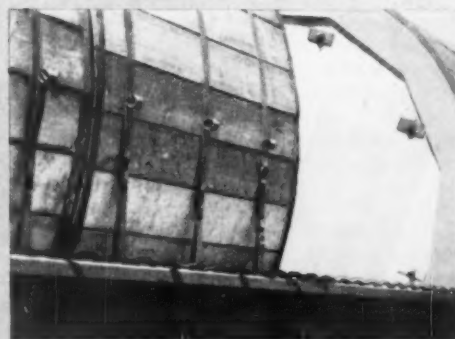
CORRELATED HOPPER UNITS

The one-piece, cast steel frame unitizes each individual hopper into a structurally sound, functional assembly which assures positive door fit. The adjustable locks, cast steel hinges, and symmetrical tapered door flange make possible the *only* adjustable door fit permitting compensation for wear or common irregularities of construction. "Balanced" unloading is assured by dual door operation and a method of controlled flow.



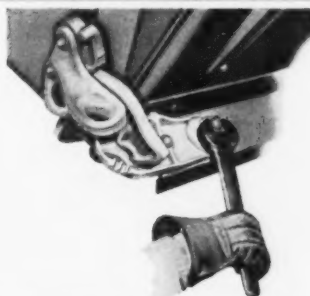
DROP BOTTOM SPRING HINGES AND ADJUSTABLE LOCKS

Drop Bottom Gondolas equipped with these two Wine products provide the shipper and receiver of the lading with a positive closure and afford a fast, economical one-man operation, with selective single or multiple opening of doors.



CONTINUOUS LADING BAND ANCHOR

Wine's continuous offset bar for top-coping applications provides a secure anchor for lading bands every 7½" of its entire length. Permits the use of all types of banding material.



ADJUSTABLE HOPPER DOOR LOCKS

The adjustment feature allows compensation for construction differences and readily permits adjustments necessitated by wear. Wine Adjustable Hopper Locks are adaptable to built-up, structural hopper openings as well as cast steel frames.



DROP END LOCKS AND END BALANCERS

The complete drop end combination from operating and security standpoints! Interlocked corners provide rigidity to keep the sides from spreading under load. The balancer incorporates the hinge function . . . permits a one-man, time and labor saving closure.



UNIVERSAL LADING BAND ANCHORS

Easily applied on all flat cars and gondolas, the Wine Universal Type Anchor features 360° rotation for tie-ins from any direction. Versatility of use permits welding on coping at important locations as well as mounting in the floor. Drop flush when not in use.



THE WINE RAILWAY
APPLIANCE COMPANY
TOLEDO 9, OHIO

Coordinated Mechanical Association Meetings

(Continued from page 32)

Lubricating Pads

Presently, there are between 325,000 and 360,000 freight cars with lubricating media other than loose waste. Approximately 1,600,000 cars are waste lubricated. In the past two years, when large-scale lubricator applications have been made, these devices have been going under about 10,000 cars per month. To comply with Interchange Rule 3 on the date of January 1, 1960 for the elimination of all loose waste, it would be necessary to equip cars at the rate of 90,000 per month for the next 18 months.

While "a considerable number of railroads are reported to show better than a three-to-one" performance improvement for lubricating devices, "there is a pressing need for improvements in the pads themselves," the Committee stated. Principal shortcomings are in materials, wicking, tendency to displace under impacts, limited journal contact area, lack of interchangeability, renovation difficulties and susceptibility to damage. Rapid deterioration of pad materials, lack of resistance to wear and abuse, lack of resiliency, and weaknesses in sewing all present fields for investigation, according to the Committee.

The tendency to shift, roll and distort is a characteristic of a number of pads which should be eliminated. Road tests on one road showed that pads which had shifted or rolled would operate 10 to 25 deg warmer than when they were in their proper position. At the same time, the Committee commented on the fact that

some lubricating devices require alterations to box interiors which make it difficult to substitute any other lubricator in event of failure.

Journal Stops

With 10,000 sets of journal stops in service, the Committee reports the following:

- Better load distribution and bearing wear with less spread linings.
- Less damage to dust guard and oil seal.
- Better performance from lubricating pads.
- Fewer hot boxes.

Truck maintenance is an important factor in hot box prevention. Conditions contributing to improper load distribution on bearings include bent spring planks, broken truck springs, fouled center plates in need of lubrication, loss of side bearing clearance, flat wedges and worn journal box roofs, and defective wheels.

Controlled-Clearance Bearings

The results of using controlled clearance bearings have not been too encouraging. The Committee said that there is no clear-cut indication that their use has contributed to lowering the hot box rate.

There are numerous cases of errors in using these bearings. During a 52-day check at repair tracks and car shops of one railroad, 209 cars were found with the wrong bearing applied. In these 209 cars, 45.5 per cent of the mis-applications involved the use of A-3 bearings where A-1 bearings

should have been used. In another 60-day check, an additional 121 cases were found and these were all discovered because they were operating above normal temperatures. The railroad found that even properly applied controlled-clearance bearings operate at above normal operating temperatures. The bearings wear across the entire bearing surface. Overheating was attributed to the shearing of the oil film by the sharp edge left on the lining metal. With 0.020-in. clearance, the new bearing shortly wears so that the edge acts as a wiper on the oil film.

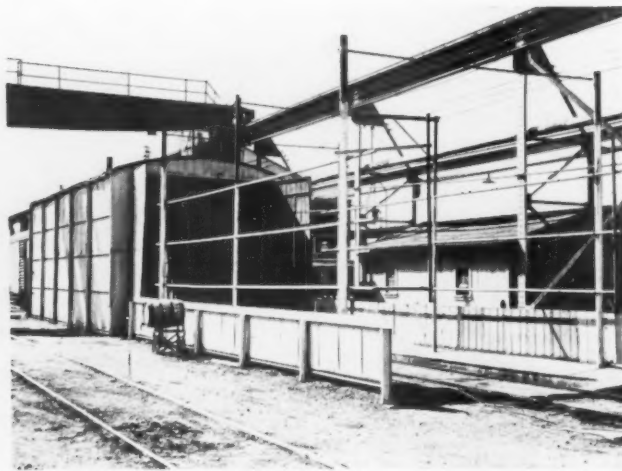
The Committee commented that it is good engineering practice to chamfer the edges of the lining metal on bearings in diesel engines, line shafts and for similar applications. It was also standard practice on steam locomotives. Bearings in internal combustion engines are pressure lubricated. In the car bearing assembly in which oil must be carried on the journal surface from the reservoir at the bottom of the box, there is need for chamfer. The Committee suggested that the AAR study the possibilities of making a chamfer on the front and back of the bearing.

Today's dust guard "has never functioned as intended", the Committee stated. Oil-saturated trucks, car floors, rails and ballast are all consequences of substituting pads for loose waste. While there was some oil loss with waste, the problem has been intensified by the introduction of pads. One road reported that as much as 15 oz of oil is lost per 1,000 miles from some journal boxes. Some roads are reducing the quantity of free oil maintained in boxes. One requires that the depth of this oil be no more than $\frac{1}{2}$ in., another $\frac{5}{8}$ in. and a third $\frac{3}{4}$ in. The committee said that while there is little oil loss under the lid with



Norfolk & Western paint stripping at the Portsmouth, Ohio, shop was described for the CDOA Committee on Painting. A hot alkali is used for paint removal. In four years, 3000 box cars and 18 covered hoppers have been stripped. The solution is applied to the cars through nozzles at temperatures ranging between 160 and 170 deg F. The alkali collects in troughs and flows back to the storage tank for reuse. A box car can be stripped in 5 to 10 min, depending on the number of coats and the type of paint applied to the car.

After stripping, the car is rinsed with cold water and then



sprayed with a 5 per cent phosphoric acid solution. The car is again rinsed. This is done outside the stripping shed, and the same nozzles apply both the phosphoric acid and the rinse water.

The entire operation is performed by one man. "Since the stripping operation was started," W. A. Faris of the N&W reported, "we have inspected many of these cars and we find the paint to be holding up very satisfactorily with practically no peeling. We consider that we are obtaining highly satisfactory and economical results with this stripping system."

normal conditions, lid seals do keep dirt and water out of boxes. Lid seals must be at least $\frac{3}{8}$ in. thick to fill the irregularities between box lips and lids. "An adequate dust guard and oil seal has yet

to be developed," according to the committee, "and it appears that a positive oil seal cannot be made for the present type axle and journal. It is one of the primary problems which must be solved."

Air Brake

Excessive Heat Costly to Air Brake Equipment

THERE IS NO limit to the number of heating cycles which AB and AC equipment can be exposed if critical temperatures of 170-180 deg F are not exceeded when air brake equipment is exposed to external heat to thaw out frozen loads of coal, ore, crushed rock, sand and gravel, the Central Air Brake Club reported to the Air Brake Association.

Among the thawing methods used, open flame, hot air and infrared heating require careful control of temperatures and protective equipment. The open flame is probably the most widely used method of thawing hopper and similar bottom-unloading cars. This heating does the most damage to paint and car structure, as well as air brake equipment, because it is essentially uncontrolled. Methods range from the building of fires under the car with wood, coal or oil to the use of flame throwers or torches fired with gas or oil.

The limitations with respect to the damaging of various parts of the brake equipment are:

- Maximum internal temperatures of 170 to 180 deg F can be tolerated in AB and AC without detrimental effects.
- Internal temperatures of 250 to 300 deg F cause the following types of permanent damage: slide valve leaks far beyond code limits which do not correct themselves when the valve cools down; loosening of service and emergency portion bushings; warping and distortion of covers creating leakage and misalignment; break down of lubrication; or damage to rubber parts.
- Reservoir flange gaskets can withstand temperatures of 240-250 deg F without excessive rubber flow or leakage.
- Wabco seal pipe-fitting compression seals withstand internal temperatures of 190 to 200 deg F without detrimental effects.
- Brake cylinder lubricant will remain stable at temperatures below 200 deg F. Components of the brake cylinder will withstand 200 deg F.

Oven tests were run with AB and AC valves at various initial temperatures from minus 40 deg to plus 70 deg. The times to reach a critical internal temperature of 175 deg were tabulated. Results showed the AB valve was 20 to 25 per cent slower to heat internally than the AC valve. The effect of paint color was also

checked during this test. In 40 min of exposure the black portion skin temperature of the AB valve equalled that obtained in 60 min with the gray portion. There was less difference in skin and internal temperatures with the black paint. The same internal temperature was reached in 23 min with a black AB emergency portion as in 60 min with a grey portion.

An AB emergency portion, painted gray, was subjected to eighteen 60 min

Heat Penetration in Control Valves
Exposed to Single Radiant Heat Source
(Temperatures are in Deg F)

Exposure Time, minutes	15	30	45	60
AB Valve				
Skin temperature	156	193	220	240
Internal temperature	117	138	152	171
Cast Iron AC Valve				
Skin temperature	142	168	188	203
Internal temperature	131	159	178	195
Aluminum AC Valve				
Skin temperature	167	202	225	242
Internal temperature	136	169	193	212

Modified Air Tests Could Save RR's 3,200,000 Man Hours

A STATISTICAL analysis of air brake defects contained in the Montreal Air Brake Club report to the Air Brake Association is the first phase of the problem of determining economic balance between the amount of air testing necessary on freight cars and the benefits to be derived.

Modification of the single car test device and a modified test routine to detect the two most prevalent air brake defects indicate an air tester could increase his productivity from an average of 12 to an average of 30 cars on an 8-hr shift.

The AAR requires all repair tracks use the single car testing device equipped with a flowrator designed to detect brake system leakage. At present, all cars due for in-date testing must be completely tested by the railroads in compliance with the Single Car Code of Tests, involving the following operations: Charging Test, Application Test, Slow Release Test, Service Stability Test, Piston Travel Check, Emergency Test, Release After Emergency Test, and Retaining Valve Test.

The purposes of a study, made by a large Canadian railroad to investigate freight car air brake testing procedures on repair tracks, were to check efficiency of the test routine and ultimately to determine the amount of testing necessary for safe

radiant heats, being allowed to cool to room temperature between each test. The only noticeable effect of the heat was that the slide valve leakage increased as much as $7\frac{1}{2}$ cu in. per min during heating. When the valve cooled, the leakage returned to test code limits.

Extensive investigation of radiant heat thawing were made during the past winter on one railroad. The heat sources were re-arranged to avoid excessive heat on air brake hose and other equipment. When the temperature of the various devices was kept within the critical range, valves and other parts went through the equivalent of nine years service. No rubber parts of the AB and AC equipment showed any apparent adverse effects.

Various means of protecting air brake devices from elevated temperatures—asbestos blankets, box housings and shields—were discussed. At best, they are expensive, time consuming to apply, and hamper routine maintenance and inspection. Some of the detrimental effects that can be expected from temperatures in excess of 170-180 deg are excessive brake pipe leakage, and stuck or inoperative brakes.

Torch methods and high temperature heating sheds can cause considerable damage to brake rods and rigging. Rigging can be severely stretched so that slack cannot be taken up unless the car is shopped for repairs. This stretching is caused from having the hand brake or air brake applied when thawing the car with a high uncontrolled temperature.

train operation. A committee was instructed to make a system-wide survey and recommend any new methods which would increase efficiency.

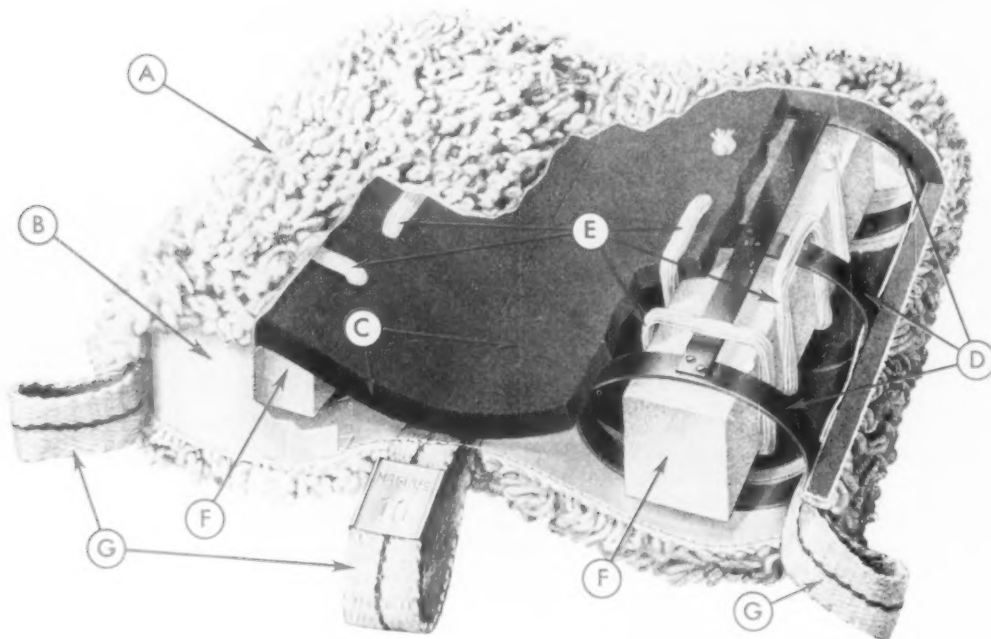
One phase of the survey indicated that one man could test properly, correct leak-shift. At an average of 40-min per car, age, and adjust piston travel when necessary, on an average of 12 cars in an 8-hr and if performed four times per year, it would amount to over five million man hours per year for more than two million freight cars in US and Canada. The survey also revealed that largely due to time consuming charging periods, the non-productive time of an air tester was in many instances over 15 min per car.

To increase the air tester's output within existing test rules, a standard air brake testing truck incorporating a separate charging line was used. By having a specified routine for its proper use, the tester's average daily output per 8-hr shift could be increased from 12 to 16 cars. A 25-ft charging hose would enable the tester to move from one track to another in case cars are not in sequence along a single track. Performing the work in accordance with the new instructions requires about 30 min per car test, a reduction of 10 min from the original average testing time. This would result in a saving of 1,300,000 man hr annually air-testing two million freight cars at 3 month intervals.

(Continued on page 40)

NOW—A CAR JOURNAL LUBRICATOR DESIGNED AND

IT'S THE *NEW MAGNUS*



FEATURES and ADVANTAGES

- (A) **Outer Cover** of tufted premium quality cotton yarn with heavy duck backing provides an ideal application and absorption surface which is glaze-resistant. It is washed and shrunk prior to assembly, assuring proper fit, and is stitched at both ends to prevent raveling and bunching in service.
- (B) **End Covers** of cotton bolting cloth web assure lasting strength and flexibility—keep dust and dirt out of the internal wicking materials—restrict oil loss.
- (C) **One-Piece Felt Pad** backs up the tufted cover and is formed around the two sets of steel springs and sewn together on the center line to make a single pad, with twin-lobe design—a far more rugged construction with better capillarity than if two separate pads were sewn together.
- (D) **Flat Steel Springs**—three firmly connected springs in each lobe maintain constant and correct pressure on the journal. Scaleless tempered spring steel will not sag and allow the pad to fall away from the jour-

nal. The springs are firmly secured to the underside of the felt and cover and are riveted to spring steel spacer strips—a construction that positively prevents misalignment or contact of springs with the journal.

- (E) **Internal Wicks** of 25-ply Bostonia provide 16 supplementary oil paths from the bottom to the top of each Magnus Lubricator Pad. Thus the design includes a combination of circumferential wicking, internal wicking and center feed wicking, assuring ample oil flow under all conditions.

- (F) **Polyurethane Cores**—used solely to increase oil reservoir capacity—make for greater margin of safety in event of oil starvation by contacting the 16 internal wicks.

- (G) **Extra-Strong Loop Handles** extend through pad centers, will withstand a pull of 300 pounds before failing. Additional loop handles are provided at each of the four corners. Brass nameplate on center loop carries the size identification. Magnus Pads are currently available in standard sizes for 5 x 9, 5½ x 10 and 6 x 11 car journals.

MAGNUS

Solid Bearings

MAGNUS METAL CORPORATION

BUILT BY JOURNAL BEARING EXPERTS

LUBRICATOR PAD

3-way wicking, large oil capacity, rugged one-piece twin-lobe construction are features of the MAGNUS journal lubricator that's now approved by AAR for interchange test installations

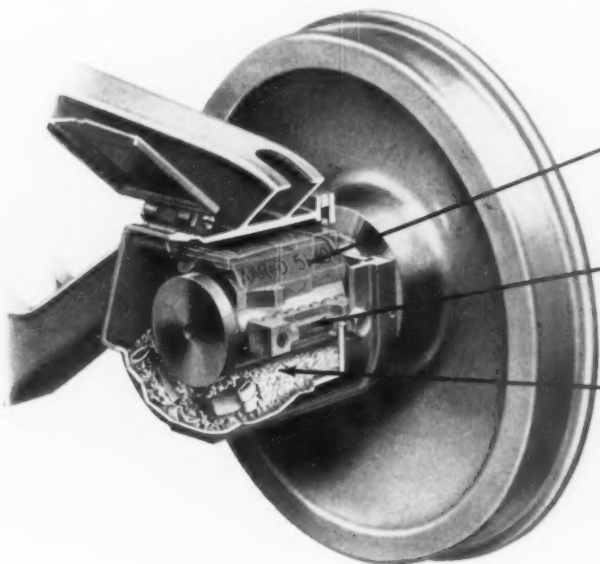
WHAT YOU need in a lubricator you get in the new Magnus Pad. First, there's maximum wicking — circumferential, internal, and center feed — to provide cooler operation and a far greater margin of safety in event of oil contamination. Internal wicks are *not entrapped* — wick more oil and are readily cleaned through normal reclamation process.

Then there's high oil-retention capacity — fully saturated, each Magnus Pad will hold more than 2.5 times its own weight in oil — better than 5.9 pints for the 6" x 11" size.

The cover is heavy pre-shrunk duck tufted with premium quality cotton yarn (proved the most practical design) and backed with high capillarity felt.

It's positively held against the journal at all times by elliptical tempered steel springs that eliminate sponge-type uplift media. The springs are firmly secured to both felt and cover. The whole is a unique one-piece twin-lobe reversible design, self-centering on the journal — end-enclosed to restrain loss of oil. It's a lubricator pad designed by bearing experts to give railroads the performance needed.

Get the full story on the NEW MAGNUS LUBRICATOR PAD. We will gladly send you complete information and answer any detailed questions you may have regarding its construction and operating characteristics. Write to Magnus Metal Corporation; 111 Broadway, New York 6, or 80 E. Jackson Blvd., Chicago 4, Illinois.



For Tops in Bearing Performance at Lowest Possible Cost

Magnus Solid Bearings — Are easy to maintain or replace. They can take the maximum load, make the fastest schedule. They save excess weight and have the lowest possible running resistance in pounds per ton.

Magnus R-S Journal Stops — Positively prevent excessive axle displacement during impact, braking, switching and humping. The result is better bearing performance with far lower maintenance, doubled bearing life, and reduced wheel flange wear.

Magnus Lubricator Pads — Provide a constant and uniform oil film for solid journal bearings. Three-way wicking, large oil reservoir capacity, rugged one-piece twin-lobe construction—these are three of the features that make Magnus Pads your best bet for efficient pad journal lubrication.

Subsidiary of **NATIONAL LEAD COMPANY**



Coordinated Mechanical Association Meetings

(Continued from page 37)

With the above savings in mind, the committee then conducted a survey on four major repair tracks in Canada to determine the percentage of failures detected in each test called for in the Single Car Code. By concentrating only on those individual air tests which detect most of the defects—air leaks and brake cylinder piston travel—air brake detention time in terminal yards might be reduced.

The results of air tests on 27,000 cars showed that approximately 46 per cent were trouble-free and that 49 per cent tested required piston travel adjustment. This represents 91 per cent of the cars having defects. In addition, about 23 per cent of the tests revealed air leakage in excess of the condemning limit. All other tests required by the Single Car Code detected defects on only 2.5 per cent of the cars, or 3.34 per cent of the total

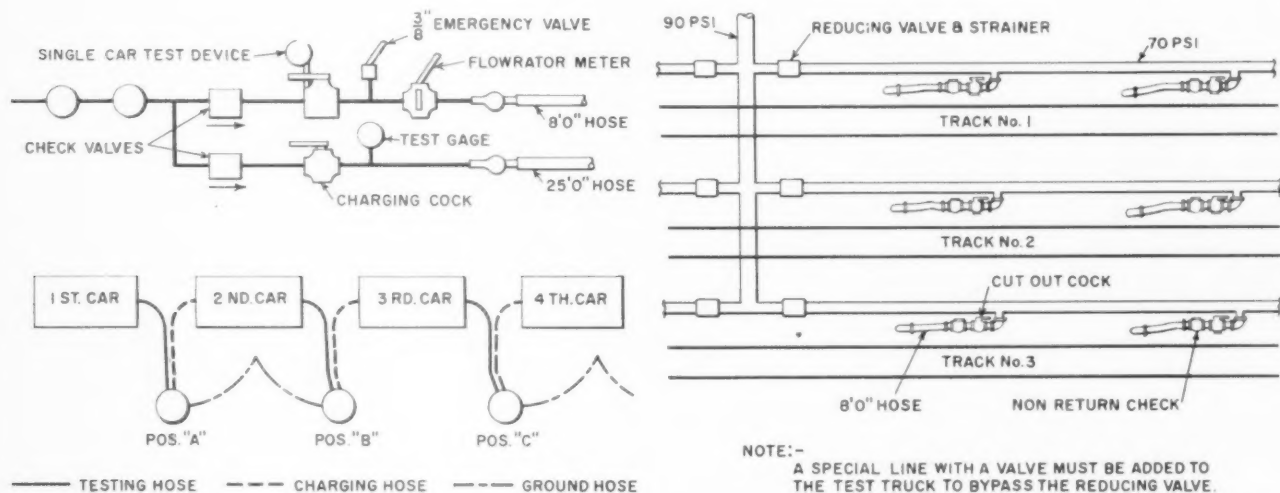
number of defects. These suggest the flowrator meter test and a 20-lb reduction to determine piston travel would detect most of the air brake defects on a freight car.

A modified test was performed on 729 cars that would detect the two most prevalent leaks. Pipe lines were installed adjacent to the tracks on a section of one large repair track to permit the simultaneous precharging of all cars assigned for air testing on each shift. The air tester was instructed to check each car for air leaks with the flowrator meter, make a 20-lb reduction to check piston travel, and then release the brakes. The air tester also made the necessary corrections when air leakage was detected, and adjusted piston travel when required.

This method showed that the air testers productivity could be increased to an average of 30 cars tested per 8-hr shift. This is equivalent to an average of 16-min per

car when performing the modified test and 40-min when testing in accordance with the Code of Tests—a saving of 24-min per car. Test results showed that 97.5 per cent of the cars had either no defects or defects that could be detected by checking for air leakage with flowrator meter and then making a 20-lb reduction to check piston travel. Assuming an average of eight million in-date tests per year, this modified test would result in a saving of 3,200,000 man-hr annually to the roads.

The committee, however, feels that evaluation of the 2.5 per cent of cars with defects going into service will have to be made before considering this saving an advantage. To do this, they strongly urged the Air Brake Association to carry the work into its second phase—evaluating the consequent cost of certain undetected defects to train operation. The statistical frequency of occurrence of defects and cost will make it possible to determine, on the basis of probability, the extent to which the Single Car Code of Tests can be modified for in-date testing.

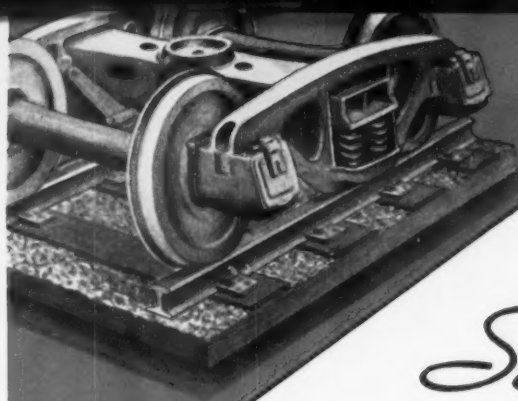


Proposed simplified brake test routine could be used as shown here. An additional charging line is needed for this operation.

Piping on typical repair track would be as shown here. Special line with valve must be added to test truck to bypass reducing valve.

The Proposed Inspection Routine:

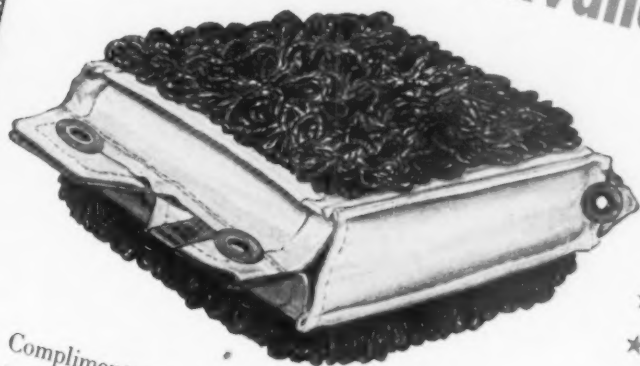
- Place the testing device in position "A" and connect the test hose to the first car and the charging hose to the second car. Make sure that the angle cocks are open on both cars.
- Close the charging cock on the test device and place the test valve handle in No. 1 position.
- After blowing out the ground air line, connect the testing device inlet hose and the open ground air cock.
- Blow out the trainline on the first car and apply the dummy coupling. Allow the first car to charge in accordance with instructions contained in the Single Car Code of Tests.
- When the first car is completely charged and passes the flowrator meter test open the charging cock on test device.
- Blow out the trainline on the second car and close the angle cock.
- Commence testing the first car in accordance with the instructions contained in the Single Car Code of Tests.
- During the release portion of the slow release test, close the charging cock on the test device. Open this cock after the brakes have released.
- After the first car is completed, close the ground air cock, close the charging cock and open the 3/8-in. emergency cock on the test device.
- Close the angle cock on the second car and disconnect the test charging and inlet hose.
- Move the testing device to position "B" and connect the test hose to the second car and the charging hose to the third car.
- Close the charging cock and place the test valve handle in No. 1 position on the testing device.
- After blowing out the ground air line, connect the testing device inlet hose and open the ground air cock.
- Open both angle cocks on the cars at position "B", then remove the dummy coupling from the first car. When walking back to the second car, stop and release the air from the first car.
- Apply the dummy coupling to the second car and open the angle cock slowly to prevent an emergency application.
- After the second car has passed the flowrator meter test, open the charging cock and blow out the trainline on the third car, then close the angle cock.
- Test the second car in accordance with instructions contained in the Single Car Code of Tests.
- When the second car is completely tested, follow the same routine between the third and fourth cars and so on along the line.
- When testing the last car on the shift, the charging cock on the device is to be left closed.



MEMO FROM THE GENERAL OFFICE

*Jim—Still too
many hot boxes
Suggest using Acme
Lubricators*

The JBS ACME LUBRICATOR is a Positive Advance in Journal Lubrication



- ★ Retains 4 times its own weight in oil
- ★ Requires no modification of journal box
- ★ Wicks AAR specification car oil even in coldest weather
- ★ Assures better performance with less servicing
- ★ Cannot Glaze—Wool-cotton chenille loop surfaces
- ★ Has exclusive patented all-wool quilted core*
- ★ Reinforced for extra wear
- ★ Readily reclaimed

Complimentary reports are coming in from scores of railroads throughout America, Canada and Alaska using JBS Acme Journal Lubricators, a product of the Journal Box Servicing Corporation, that JBS Acme Lubricators are greatly reducing hot boxes in their operations. Heavy chenille loop pile surfaces assure an ample supply of filtered oil at all times and own weight in oil reserve. JBS Acme alone has the exclusive all-wool quilted core* which retains many times its weight in oil reserve. JBS Acme Lubricators are unaffected by temperature changes and wick AAR specification car oil prevent glazing. JBS Acme Lubricators require no modification of the standard journal box, are designed to hold their position in the box, and assure better performance with less servicing.

Write Today for Information and Folder

GUARANTEED
Quality, Workmanship and Material
as represented

Copyright 1958—Journal Box Servicing Corp.

*Patent applied for

JOURNAL BOX SERVICING CORP.

"30 Years in Car Lubrication"

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GENERAL OFFICES: 1112 E. KESSLER BLVD., INDIANAPOLIS 20, INDIANA

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now the
famous one-piece
Morton
OPEN-GRIP

running board
gives you



the
UNI-WING
flange

Stronger

Fully AAR approved

The rugged, die-formed flanges of the new Morton **Open-GRIP** running board aid installation, eliminate welded brackets.

Withstands rough treatment without damage.

Still the famous **Open-GRIP** KASS safety features and rigid edge construction for strength where it's needed.

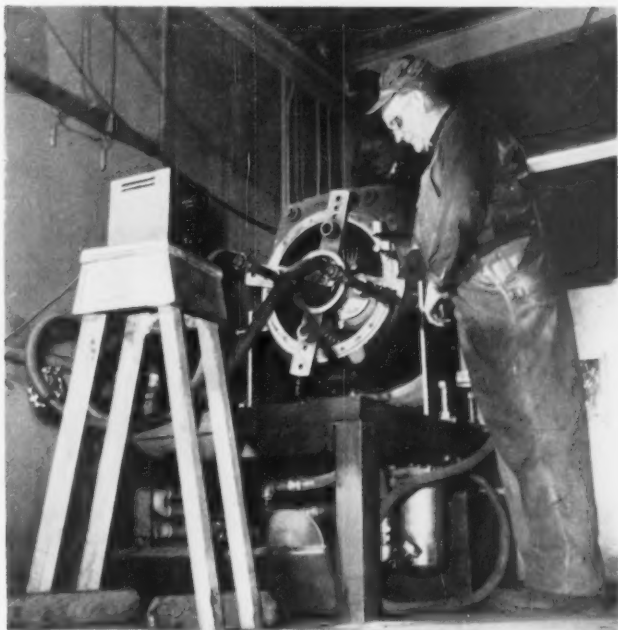


Morton MANUFACTURING COMPANY

5125 West Lake Street • Chicago 44, Illinois

DIESEL REPAIR TIME-SAVERS

Turbocharger Test Stand



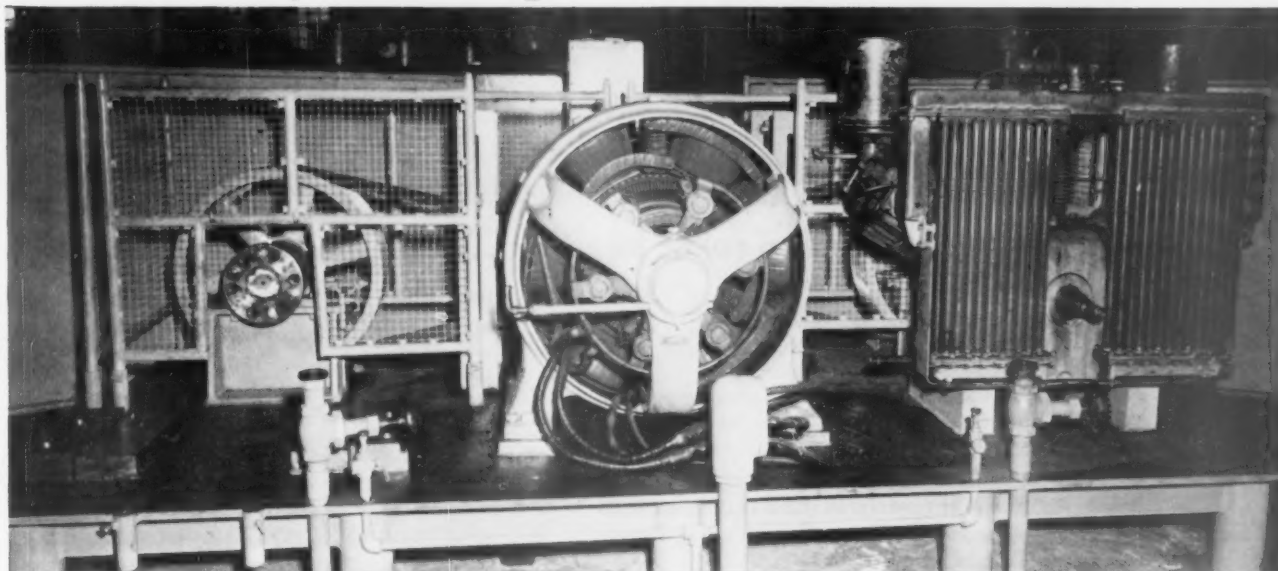
Repaired turbocharger is operated with compressed air in this special set-up at the Altoona, Pa., works of the Pennsylvania. Air streams are directed across the blades to check the operation of the rotor and bearings. Speed of rotation is checked and adjusted with readings from stroboschometer in the foreground.

Burlington Coupler Bushings



Ball ends for E couplers are being made in lots of 50 at the West Burlington, Iowa, shop of the Burlington at considerable savings. Scrap diesel axles are used. The balls are first rough-turned in a turret lathe. This machine lathe, equipped with an expanding arbor, has a special circular jig to cut the ball radius.

Western Maryland Compressor Test Stand



Air compressor test stand, designed and built by the Western Maryland at its Hagerstown, Md., shop will accommodate both Gardner-Denver and Westinghouse compressors either for checking or break-in. Set-up time is minimized by providing separate permanent mounting plates for both types of machines. Compressor is driven through a V-belt drive from a 75-hp dc

motor with speed controlled through a variable rheostat. Following rebuilding, the compressors are tested according to manufacturers' recommendations with records of air temperatures and pressures at various operating speeds recorded. Total test takes approximately 8 hr for either type of air compressor used on WM locomotives.



Where payloads roll on roller bearings . . . Gulf makes things run better!

NEW GULFCROWN R.R.

New Gulfcrown R.R. is a lithium base grease especially developed to provide better lubrication for railroad car roller bearing journals. It has been tested and approved against A.A.R. Specification No. M-917-56.

Stands up at high temperatures. New Gulfcrown R.R. has been used successfully in bearings operating at temperatures as high as 250° F.

Pumps freely at low temperatures. Gulfcrown R.R.

Grease doesn't become hard, or unworkable, even when subjected to temperatures as low as 0° F.

Won't thin out at high speeds. Its excellent mechanical stability keeps Gulfcrown R.R. from thinning out under the churning action of high speed bearings.

Resists washing action of water. Won't wash away even under wettest conditions. Gulfcrown R. R. also provides protection against rust.



GREASE

Excellent oxidation stability. New Gulfcrown R. R. Grease is effectively inhibited against oxidation to insure long life, both in storage and in use.

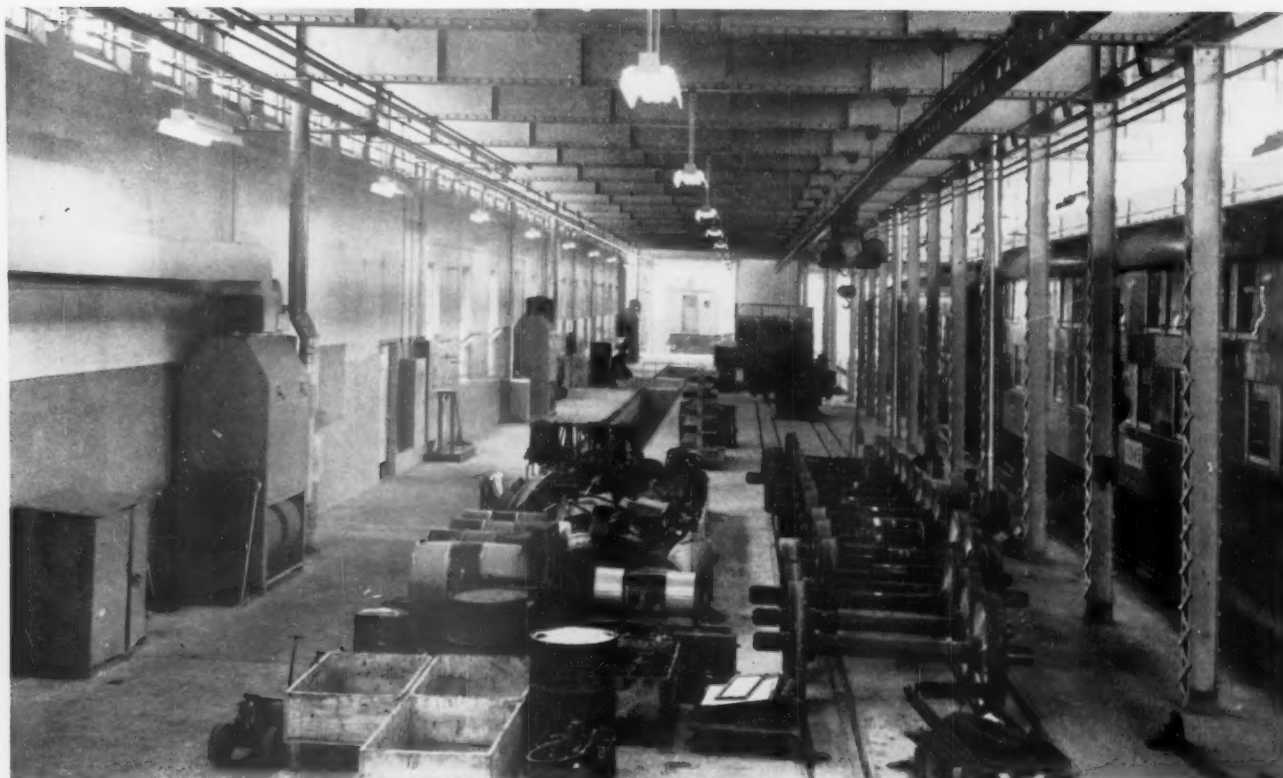
Gulfcrown R.R. Grease is available now, in 35 lb. pails, 100 lb. drums and 400 lb. drums. Let us prove that you will get more effective roller bearing protection—and reduced maintenance costs—with this outstanding new grease. Write or phone.

GULF OIL CORPORATION

Dept. DM, Gulf Building
Pittsburgh 30, Pa.



ELECTRICAL SECTION



Truck repairs are made on track adjacent to south wall of shop. The area has 5-ton monorail hoist over wheel storage tracks. Shop is heated with gas space heaters and has fluorescent lighting.

Latest Aid to Better Operation . . .

Long Island's Dunton M-U Shop

A REHABILITATION PLAN started in 1954, has resulted in big improvements in the plant and service of the Long Island. Under this plan, the Pennsylvania loaned \$5,500,000 to the Long Island and agreed to forego any dividend or interest payments on its \$120,000,000 investment in the Long Island for a 12-year period. The plan contains a tax forgiveness feature which cuts the railroad's state, county and local tax bill approximately in half for a nine-year period. The railroad has been permitted to make fare increases totaling approximately 20 per cent.

The railroad's response to this relief has been so quick and effective that in spite of fare increases, public criticism has almost disappeared. New air-conditioned cars were purchased (RL&C,

September 1955, p. 88), old cars are being rebuilt, two-way signaling is being installed in congested areas, and schedules have been reduced. For the past year, the railroad has maintained an on-time record of 97.9 per cent.

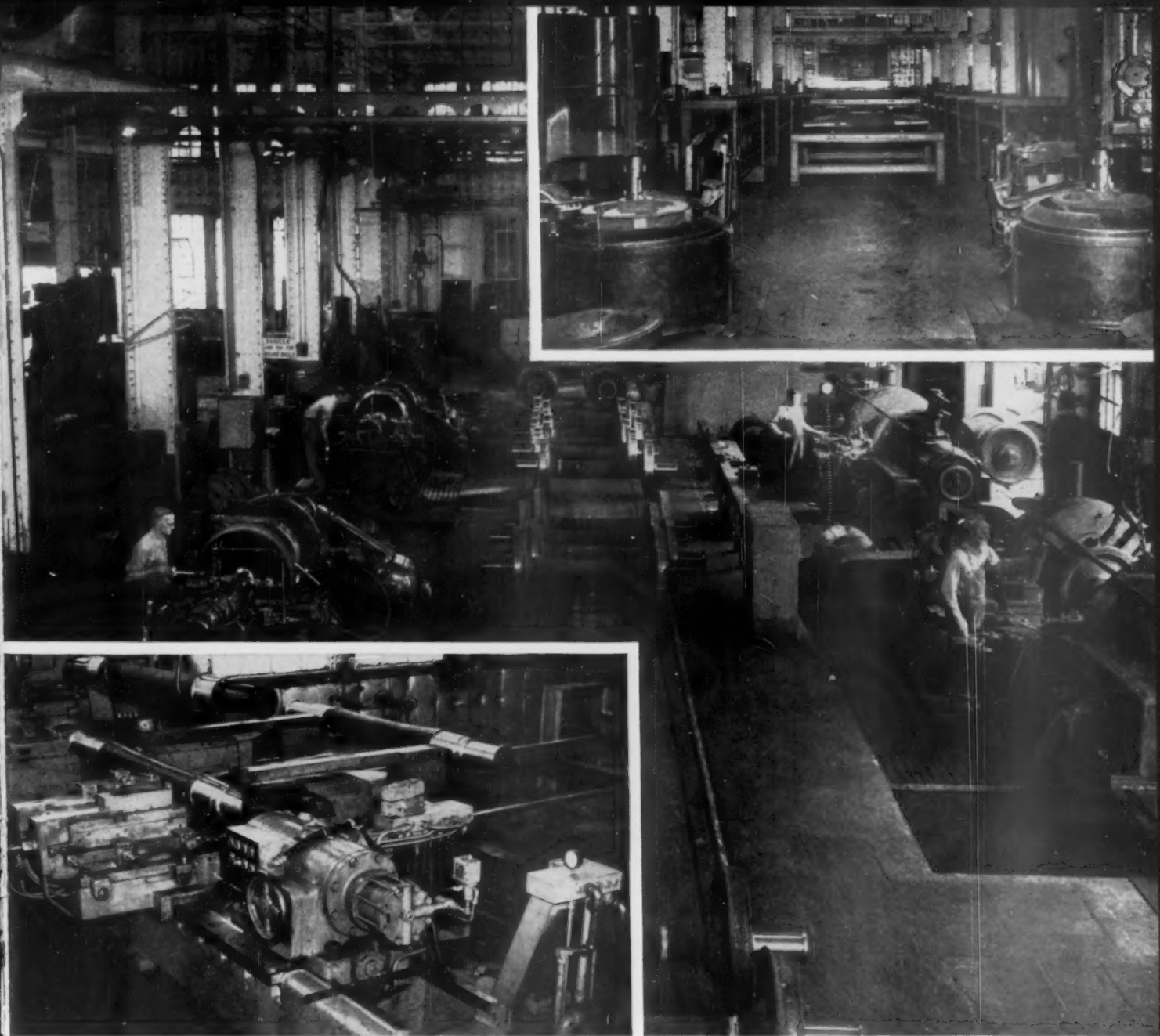
Much credit for better performance is due to improved and new shop facilities. Now part of the railroad's main shop at Morris Park, L. I., is a fully-equipped, self-contained wheel shop. Before 1954, all wheel and axle work was done in a Pennsylvania shop in New Jersey. Morris Park shop has also been provided with other new machine tools and work has been systematized.

Traction motors afford one example of what has been done. Some years ago, a wave of economy caused the shop to wind its traction motors with Class A

(cotton) insulation. As motors come in for rewinding, this has been gradually eliminated; and now practically all the motors have Class C and Class H insulation. The number of motor failures has been greatly reduced. An in-place wheel grinder is used to restore tread and flange contours without removing wheels from cars or locomotives. The railroad's 75 locomotives are all diesels; since all steam facilities have been eliminated.

The road's newest facility is the just-completed multiple-unit shop, located at Jamaica, L. I. It was rebuilt from the old shop which was erected in 1905. The old shop, which had tracks for 18 cars, handled 133 m-u cars. The new shop, with space for 36 cars, makes

(Continued on page 48)



One of the most extensive railroad machine shops is that of the Norfolk and Western at Roanoke. The above photos were taken in the Wheel Shop.

Norfolk and Western's Roanoke shops exemplify the completeness of the Niles machine tool line

The facilities of Norfolk and Western's Roanoke, Va., Wheel Shop are as extensive as the completeness of the line of Niles Railroad Machine Tools.

The Hamilton Division of the Baldwin-Lima-Hamilton Corporation supplies the nation's rail-

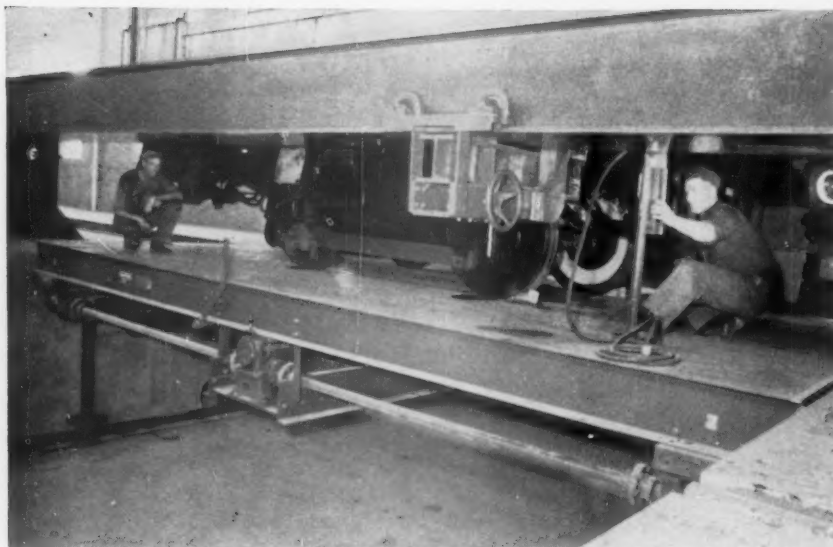
roads with a complete line of moneysaving machine tools—from the sturdy, efficient Niles burnishing lathes and wheel lathes to the new Niles wheel borer with sidehead. Write today on your letterhead to Dept. 9-K for information.

Hamilton Division Hamilton, Ohio

BALDWIN • LIMA • HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools





Movements of this Whiting Model C drop table are controlled at pushbutton station operated by man at the right. Truck is moved to special track for work.



Traveling trolley feeds third rail shoe while a motor man in the cab spots car.

inspections and light repairs to more than 600 cars.

The shop is 134 ft wide by 444 ft long and has two all-glass walls. There are nine tracks, including six inspection tracks with full-length pits inside and one storage track outside. All pits have a continuous elevated step on each side. Also inside, is a truck track and wheel pit which occupy space on tracks 1 and 2. The interior is fluorescent-lighted. Inspection pits have incandescent lights, 110-volt a-c receptacles and 100-cycle speed control test outlets. These

pits also have air outlets, and there are air outlets on the building columns, along with 110-volt receptacles and 440-volt, 3-phase outlets for welders. The building is heated with eight gas space heaters.

Service facilities extend along the north wall of the building. At the front is a six-desk main office and two private offices. Next is an air-brake room which contains an air brake inspection bench, drill press, two pedestal-type grinding wheels, two Ingersoll Rand 300-cfm motor-driven air compressors and lazy-

Susan type parts bins. The compressors supply air for blowing out equipment, for the operation of pneumatic hand tools, and for setting feed valves and safety valves of air brake equipment.

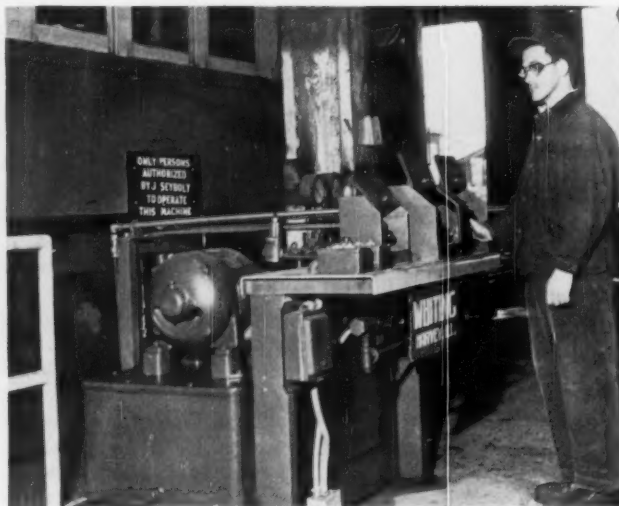
Back of the air brake room are welfare facilities and the battery room. Next in order is a drop pit under tracks 1 and 2, which provides for removing and replacing trucks. When taken from the car, they are placed on the truck track. A five-ton monorail over this track is used for changing out motors and

(Continued on page 52)



Long Island's Wheel Shop

Newest equipment at Morris Park shop is the Whiting wheel grinder installed last year. During the past four years, the shop has been equipped with all the machine tools necessary to do both car and locomotive wheel work. These include one 48-in., Baldwin-Lima-Hamilton Model FFIH, wheel borer; two 400-ton Chambers-



burg wheel presses; one 600-ton wheel press; one Consolidated 49-in., dual-end, journal and axle lathe; one Consolidated 45-in., journal and axle lathe; and two 42-in. Sellers wheel lathes. Other equipment includes one Sperry Type UR Reflectoscope; one stationary Model 12409 Magnaflux; one portable Model KAR-3 Magnaflux; one Hammond Model CB77BW combination grinder; and one Gedding & Lewis cutter grinding machine.



Photo Courtesy Chesapeake and Ohio Railway Co.

58-46

Ex-Cell-O Pins and Bushings get the green light for many extra miles

Install them, then forget them for many extra miles of rough and rugged travel . . . over 200 U. S. and Canadian railroads do just that by installing Ex-Cell-O Pins and Bushings. Often get up to a million miles of trouble-free service.

A diamond-hard steel casing and a super-fine finish resists abrasive action caused by sand and grit. A soft ductile center gives instead of cracks when cars strain over rough terrain. Electronically controlled heat treating and precision grinding assure long life, extra service. An extraordinary service policy backs up Ex-Cell-O Pins and Bushings whether you buy them separately or assembled. So why not contact Ex-Cell-O, Detroit, or your Ex-Cell-O Representative soon?

EX-CELL-O
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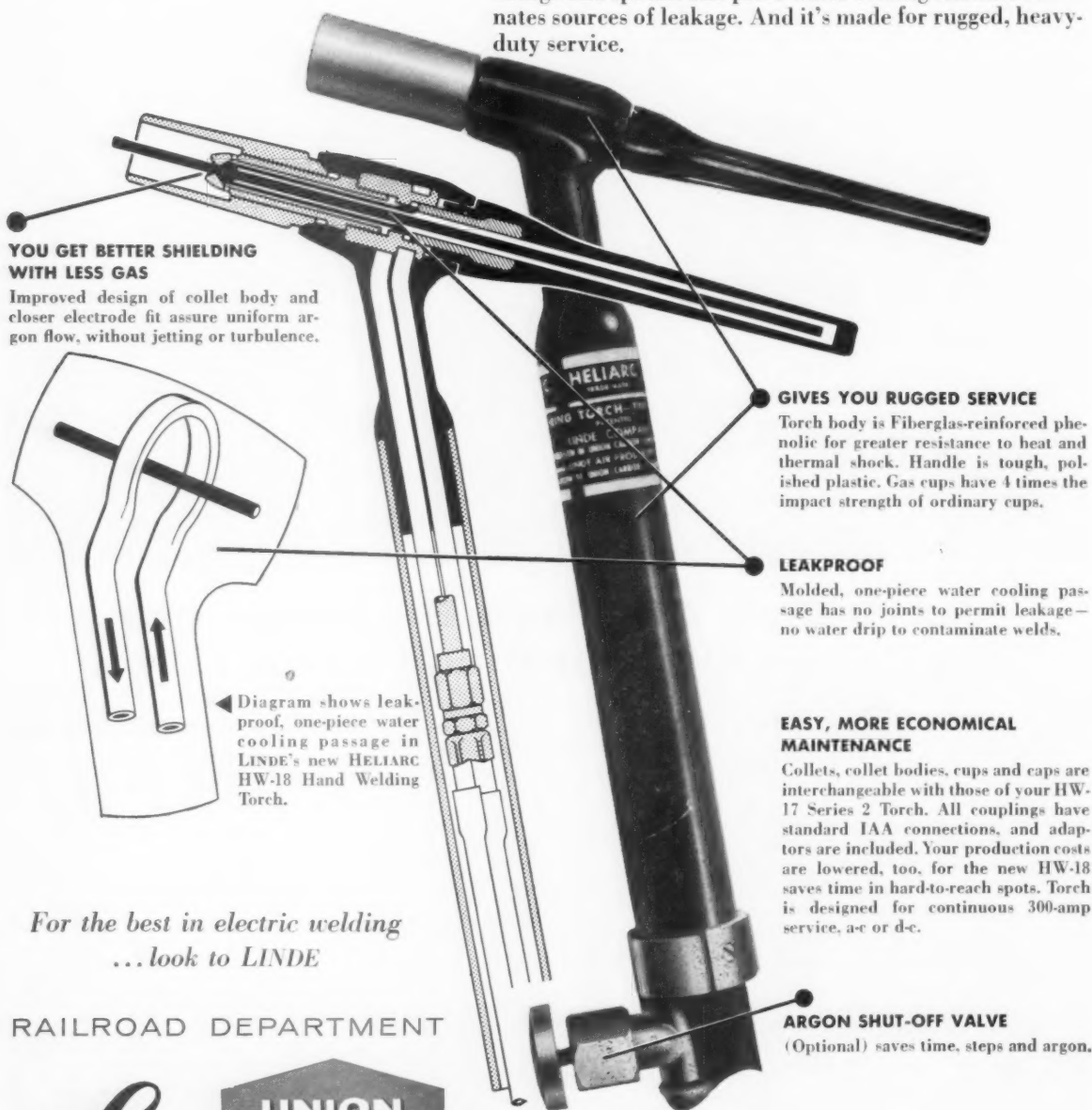
Railroad Division
EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

EX-CELL-O FOR PRECISION



Here's a **NEW WELDING TORCH** that's **WATERTIGHT...built for HEAVY-DUTY SERVICE** **...yet weighs only 7 OUNCES!**

This new HELIARC HW-18 Hand Welding Torch weighs only 7 ounces, making it easy for you to handle, less tiring. The special one-piece water cooling channel eliminates sources of leakage. And it's made for rugged, heavy-duty service.



YOU GET BETTER SHIELDING WITH LESS GAS

Improved design of collet body and closer electrode fit assure uniform argon flow, without jetting or turbulence.

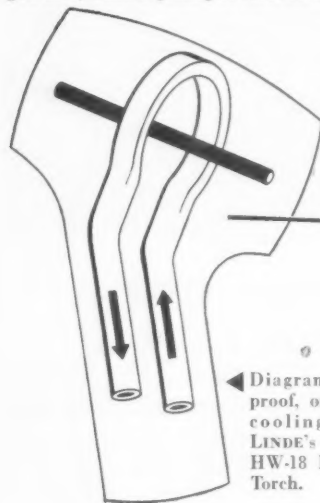


Diagram shows leak-proof, one-piece water cooling passage in LINDE's new HELIARC HW-18 Hand Welding Torch.

GIVES YOU RUGGED SERVICE

Torch body is Fiberglass-reinforced phenolic for greater resistance to heat and thermal shock. Handle is tough, polished plastic. Gas cups have 4 times the impact strength of ordinary cups.

LEAKPROOF

Molded, one-piece water cooling passage has no joints to permit leakage—no water drip to contaminate welds.

EASY, MORE ECONOMICAL MAINTENANCE

Collets, collet bodies, cups and caps are interchangeable with those of your HW-17 Series 2 Torch. All couplings have standard IAA connections, and adaptors are included. Your production costs are lowered, too, for the new HW-18 saves time in hard-to-reach spots. Torch is designed for continuous 300-amp service, a-c or d-c.

ARGON SHUT-OFF VALVE

(Optional) saves time, steps and argon.

*For the best in electric welding
...look to LINDE*

RAILROAD DEPARTMENT



The terms "Heliarc," "Linde," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

See and try the new HELIARC HW-18 Torch! Call your LINDE representative today, or write: Railroad Department, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.

LOMA Reports . . .

Maintenance Is the Key

MAINTENANCE will largely determine the frequency and magnitude of failures due to grounds, shorts and opens, the LOMA Committee on Diesel-Electrical reported in Chicago last month. If equipment is kept clean, dry and properly ventilated, much has been accomplished. Electricity does not mix with oil and water, but locomotives are not built which do not require these incompatible, yet necessary, items.

Dirt is the biggest problem and the principal enemy of insulation. If allowed to accumulate, it will also shorten creepage paths, impair the proper working of moving parts, and block ventilation passages. It can be said about cleaning electrical equipment, that wiping or

blowing with compressed air is just "good hygiene," but if cleaning with a solvent is required, that is "medication." The use of solvents is necessary in the removal of dirt in which oil or grease is present. Precautions must be observed in the use of solvents because some can be dangerous to the user or to the equipment on which the material is being used. Chlorinated hydrocarbon solvents will soften and eventually deteriorate varnish insulation.

The Committee suggested some important steps in keeping equipment dry. These include the provision of drains in main generator sumps, and the regular cleaning of these sumps. Conduits should be sealed to prevent the entry of

moisture and water. Oil leaks on the engine crankcase should be sealed.

Generators, motors, reversers and braking switches should be cleaned and kept free of oil, water and dirt. Generator and motor string bands and risers should be cleaned and repainted when necessary. Air curing of generator commutators is recommended. Terminal boards and those important connections on resistor and excitation panels should be checked for tightness at periodic inspections. Control jumper cables must be inspected and tested regularly. When in place between units, these jumpers should not be stretched or strained in any way.

Megohmmeter and high-potential tests are essential for electrical equipment. Proper records of megger readings are necessary before making Hi-pot tests. Minimum leakage distances and creepage surfaces are common sources for grounds in high-voltage circuits. The best cure is proper cleaning tailored to each specific job.

From the Diesel Maintainer's Note Book

Could Bill Sparks Have Done Better?

I ENJOYED Gordon Taylor's article in the July 1958 issue, (page 44) and the practical use to which Bill Sparks put an extension cord. It appears to me that Bill Sparks could well get acquainted with his brother, Ned Sparks, who used to work for Walt Wyre in the predecessor to *Railway Locomotives and Cars*.

While Bill got the locomotive back to its terminal under power, I think if he had been a good electrician rather than a run-of-mine diesel maintainer, he would have connected his wire to terminal GF and the reverser interlock rather than taking energy from the light circuit. This would have given the engineer control of the circuit through his throttle the same as he would have under normal operation. It would kill the temporary connection when the engineer shut his throttle off. I believe you will agree that this connection is superior and quite as easy to accomplish as the connection listed in the story.

The above criticism is offered as a

This series of articles is based on actual experiences of men who operate and maintain diesel-electric locomotives.

constructive suggestion and is not in any way intended to belittle the excellent series of articles which all of your readers are enjoying.

C. W. MARTIN

*Asst. Engineer-Diesel Electric
Baltimore & Ohio Railroad*

Dear Mr. Martin:

This case was written up to outline just what happened rather than as a criticism of the maintainer's method of meeting the situation. It did show ingenuity on the maintainer's part. He got the train moving by a short cut method of tapping the light circuit to get a positive battery connection for the reverser interlocks.

What I tried to stress was the fact that power contactors can only be activated by passage of control current through the C-D interlocks FOR, or through the F-E interlocks of REV. Bill Sparks understood that, and took the only means he could think of to quickly remedy the situation.

I thoroughly agree with your suggestion that a much better method would have been to connect the jumper wire

to terminal GF and the reverser interlock. Your method is the one that I probably would have used, had I been in Bill Sparks place. My narrative would have been improved, had I gone a step further and suggested the better method.

Diesel Notes are written to create interest, and stimulate thinking in the handling of diesel problems. Your letter proves that you think and know how to analyze a situation for the best solution. I wish that all readers would try to find better solutions than those given in Diesel Notes. If readers are caused to think and study their problems, then our Diesel Notes can accomplish their purpose.

GORDON TAYLOR





Six inspection tracks on which cars are spotted have pits for the full length of the 444-ft shop. Track at far right is used for truck repairs.

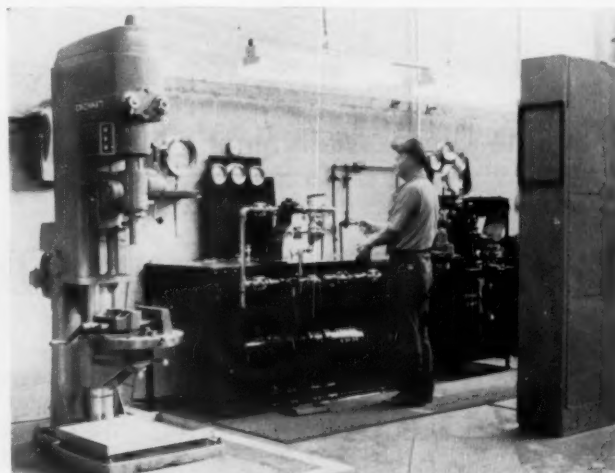
wheels. The monorail extends over the full length of the truck track and to a driveway outside. Back of the drop pit, there is a storeroom and tool lockers, one for each mechanic. Cars are brought in at the east end of the building and these entrances are closed with motor-driven rolling doors.

Other shop equipment includes two portable arc welders and two fork lift trucks. The latter serve for inside transport and to carry equipment to either of two outside driveways. There are four stationary battery chargers in the battery room and one portable one.

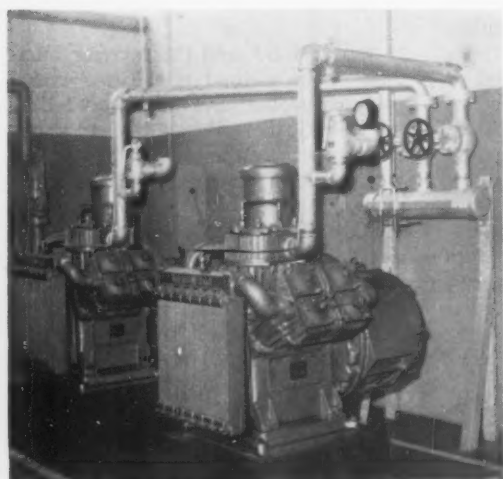
Shop work includes all regular monthly inspections along with all cars which may have failed on the road. As it works out in practice, 75 per cent of all failed cars are repaired here, and 25 per cent go on to the Morris Park back shop. The m-u shop normally works eight hours with a skeleton shift for night emergency work.



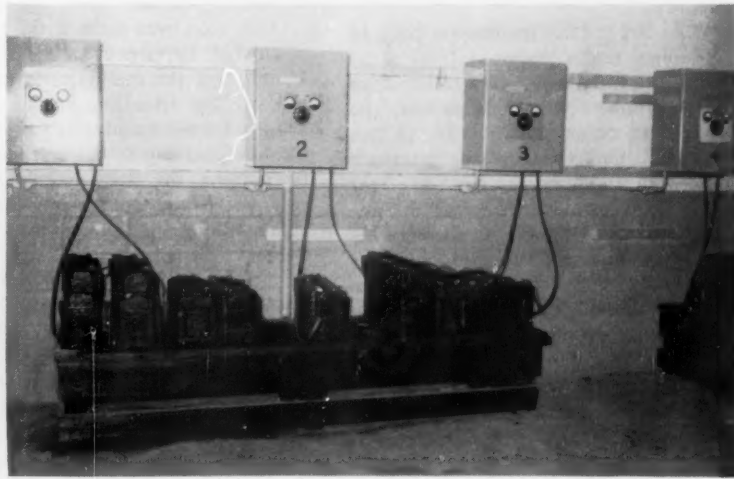
Storeroom at each end of Dunton shop stocks the small parts used in maintenance and repair of over 600 m-u cars.



Test stand is in air brake room. Other shop tools include Cincinnati drill press, two Cincinnati pedestal grinders, and two portable welding machines.



Two Ingersoll Rand Model 75MH compressors provide air for brake tests, portable tools, and for equipment cleaning.



One portable and four wall-mounted General Electric selenium rectifiers are used for charging m-u car batteries at Dunton shop.

INSIDE STORY

of the new attack
on the
**HOT BOX
PROBLEM**



AAR APPROVED
for limited application
in interchange service

CLEVITE Sealed Sleeve Bearing Cartridge

...new, permanent, soundly
engineered and economical
journal bearing conversion
for freight cars

Field Reports:

In continuing road and laboratory tests, under extremes of actual and simulated operating conditions, Clevite Cartridges are exceeding all performance expectations.

Careful shop checks show that Clevite Cartridges require less modification, are installed at lower cost than any other permanent conversion.

Keep your eye on CLEVITE!

DISTRIBUTED BY:
**STANDARD CAR TRUCK
COMPANY**

The CLEVITE Bearing Cartridge is a development of Cleveland Graphite Bronze Co. division of Clevite Corporation, Cleveland 10, Ohio

322 S. Michigan Ave., Chicago 4, Illinois. In Canada: Consolidated Equipment Co., Ltd., Montreal 2, Quebec

OAKITE BROADENS SERVICE TO RAILROADS

Oakite is strengthening its service to the railroad industry.

How? By now assigning railroad service responsibilities to its entire force of more than 250 Technical Service Representatives.

Even more important is the reason **why**. It's because proper maintenance cleaning can help eliminate the estimated \$140 million a year dirt damage to diesels alone. **Proper maintenance cleaning is Oakite's business.** Has been for nigh on 50 years.

Under this new, expanded program, Oakite offers you these big advantages:

24 hour service when you need it: Your Oakite representative is close at hand. When emergencies dictate, he'll get there fast because he's nearby.

Warehousing facilities: Talk to him about using Oakite warehousing instead of your own for cleaning materials "inventory". Buy as you need. Fifty seven warehouses across the country offer virtually same-day service... save you handling, deadheading, reshipment and inventory charges.

Continuing research: With the finest cleaning research facilities in existence, Oakite has a record of continually developing improved railroad cleaning methods... better railroad cleaning materials to solve your every problem—old or new.

Guaranteed performance: As always, Oakite materials are *guaranteed* to do the job—thoroughly, quickly... for low-cost end-results.

Engineered Cleaning Programs: The Oakite man now serving you will be glad to develop an Engineered Cleaning Program that takes into consideration *your* equipment, *your* soil problems, *your* cleaning requirements. Call him in. There's no obligation. Or, write for Bulletin F-8055. Oakite Products, Inc., 46 Rector Street, New York 6, N. Y.



in our 50th year

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

SP&S Wheel Cleaning

(Continued from page 23)

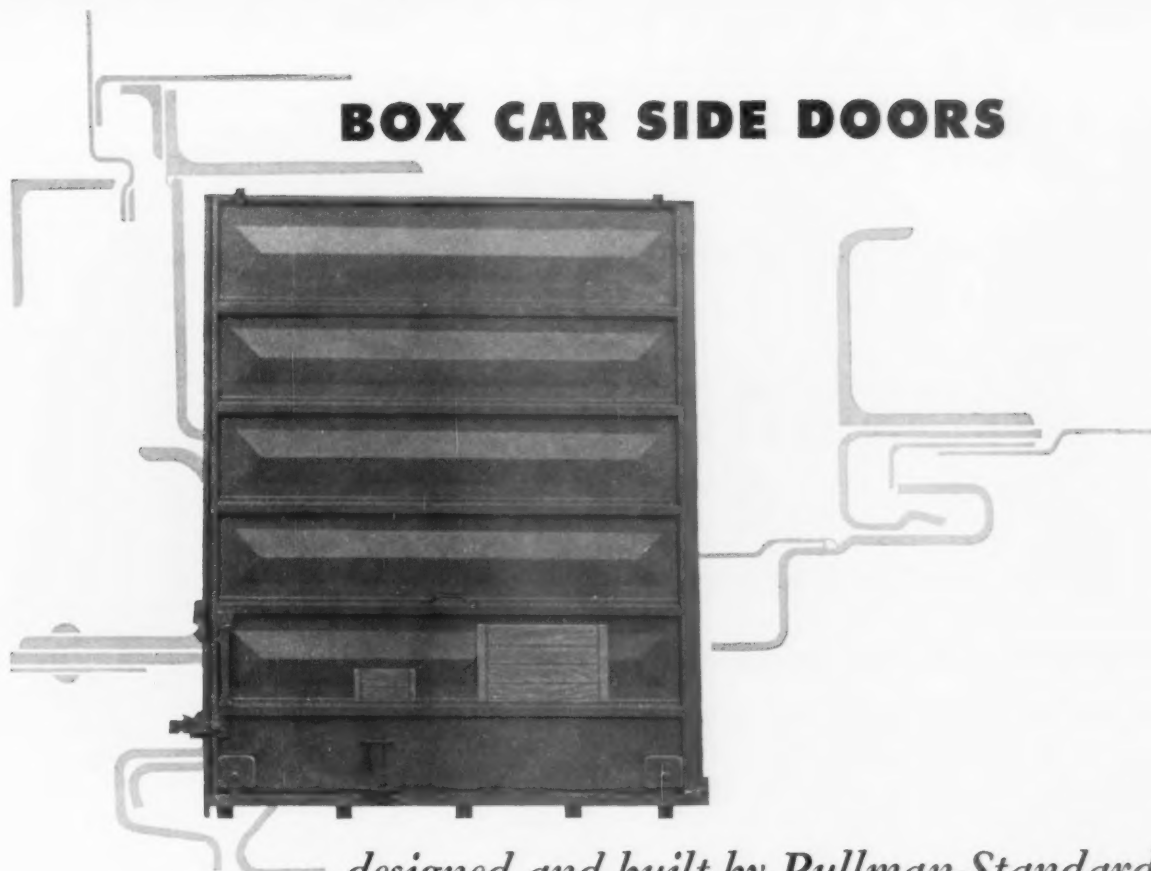
An important part of this machine is the arrangement of spray nozzles, which are made of 3/4-in. pipe nipples bent and flattened as required and connected to the 1 1/2-in. supply line with valve control for both the washing and subsequent rinsing. Two different nozzle arrangements are required. To clean the bull gear side of the wheel assembly, one spray is directed at the outside wheel face, one directly over the tread, and a third angled so that spray hits the face of the gear, the gear teeth and splashes down between the gear and the wheel. The other wheel is also cleaned by three spray nozzles somewhat more effectively located with respect to the tread and inside wheel face, owing to absence of the gear. A 1 1/2-in. pipe nozzle expanded to 2 in. and directed downward at the center of the machine provides any cleaning necessary for the axle.

The bottom of the machine is water tight and the cleaning solution drains back through a 5-in. pipe to a 600-gal steam-heated rectangular tank set in the ground at the left of the machine. Mounted on the side of the machine housing are the electric-driven solution pump, water and steam supply pipes, and valves. A small water line is installed to prime the pump and a cut-out valve avoids losing this prime between each cleaning cycle.

In operation, about 200 lb of Oakite 24 are placed in the tank of water which is heated to between 200 and 220 deg F. This cleaning solution drops to about 180 deg F as delivered under 40 psi pressure to the nozzles. The wheels are revolved under the scrubbing action of the sprays until thoroughly cleaned. The cleaning solution is then turned off and clear hot water and steam supplied to the same nozzles for rinsing. Within a few minutes after removal of the wheels from the machine they are dry. Every surface can be inspected with assurance that potential cracks or other defects are well cleaned out for easy observation.

Dirty residue from the cleaning solution settles both in the base of the machine which has to be cleaned out about every 60 to 90 days, and in the bottom of the solution tank which accumulated about 6 in. in 8 months before cleaning was necessary. The effective life of the Oakite cleaning solution depends on the number of wheels cleaned. At the SP&S shop, this generally varies between one and two months.

BOX CAR SIDE DOORS



designed and built by Pullman-Standard

- Design: by the world's largest car-builder . . . with fifteen years' experience in door manufacturing.

- Size: 9' 11" or specified height. 6'-7'-8'-9' or specified width.

- Complete with fixtures and sub-parts, all to P-S design.

- Panels of .10-inch corrosion-resistant copper bearing steel. Lock, starter and bumper of cast steel. All parts weldable.

- Extra-heavy (5/32-inch) bottom member.

- 5" rollers in door roller assembly insure easy operation.

- Precision fabricated, embossed for strength, assembled by arc-welding.

- All around sealing arrangement excludes dirt and weather, safeguards lading.

- Self-protecting design and fabrication excellence mean long life, easy maintenance.

Pullman-Standard has designed, built and laboratory and service tested a new box car side door, with integral fixtures, to fill the needs and specifications of the railroad industry. Offering maximum lading protection from dirt and weather, this new door is sealed all around by specially designed interlocking contours. The unit rolls smoothly and easily on large 5-inch diameter rollers with hardened roller bearings. The safety latch and door lock work as a unit. And the safety latch automatically locks the door in either the open or closed position after one car impact. The entire door and fixture unit is made for lasting service, durability and rugged strength.

After extensive field research to determine railroad and shipper requirements, prototypes of this door were designed, built and put into continuous laboratory and in-service tests more than three years ago. Every possible test was applied time and time again. The P-S Door withstood every abuse. Example: over 75,000 severe individual roller and bearing impacts were test-applied to prove the door roller assembly.

Confirming "on the job" acceptance of this new unit by America's railroads are the more than 2500 car sets now in service or on order by 12 major users.

Replacement parts will be kept on hand by Pullman-Standard, and railroad orders will be filled immediately from inventory.

For full information on the new P-S Box Car Side Door, and how it can be applied to PS-1 Box Cars now on order, write for literature or contact the nearest Pullman-Standard sales office.

PULLMAN - STANDARD

CAR MANUFACTURING COMPANY
SUBSIDIARY OF PULLMAN INCORPORATED

200 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILLINOIS
BIRMINGHAM, PITTSBURGH, NEW YORK

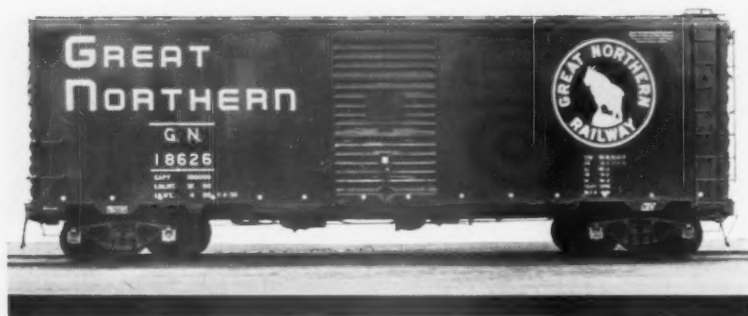
For Restoring B and C Floors

GREAT NORTHERN

is using time-proven

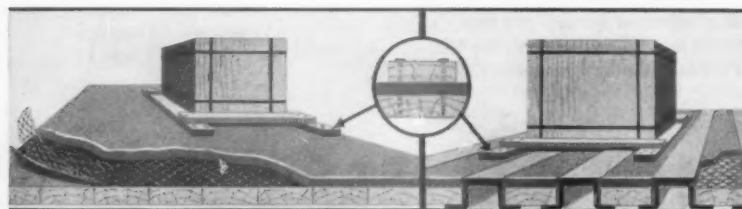
Plastinail*

Nailable Cement Flooring



REPORTS THE GREAT NORTHERN: "We made our first tests with Plastinail back in 1949. Since that time we have Plastinailed several hundred cars with very satisfactory results."

Do you have the Plastinail story? Applied to a sound B or C floor, it will provide 7 or 8 years or more of Class A service. And it's a better floor — smooth, inorganic, non-absorptive, easily prepared, nailable. Yet, Plastinail costs less than a new wood floor. The first cost is less. And the service is supreme because wood and Plastinail is 79% stronger than wood alone.



F. E. SCHUNDLER & COMPANY, INC.
504 Railroad St. Joliet, Illinois

Reading's Flange Lubrication

(Continued from page 26)

contributing to curve wear and surface defects. With so many variables, it is impossible to accurately predict conditions or recommend procedures to reduce costly rail replacements.

It is impractical to conclude that lubrication between the wheel flange and the gage side of the high rail of a curve will eliminate curve-worn rail. A method of lubrication is desirable, but should not impair wheel-to-rail adhesion on the running surface of the rail.

When molybdenum disulfide, incorporated in a solid lubricating stick, was applied to Reading locomotive wheel flanges, the following were the test results: (1) There was an average reduction of 35 per cent in rail wear rate at curves per 1,000,000 gross tons of traffic; (2) rail wear is doubled in cold weather, but molybdenum disulfide is effective over a wide range of temperatures and is unaffected by low temperatures; and (3) after one year of application from all trains over the test area, residual molybdenum disulfide on wheel flanges reduced rail wear with greater effectiveness than when used initially.

The Catawissa grade, used for adhesion and curve-worn rail tests, has approximately 47,000 ft of curved rail, 4 deg or sharper. On the basis of 1.80 cents per ft per million tons of traffic, and approximately 12 million tons of traffic annually, the total cost is \$10,152 per year for curve worn rail on a 35-mile grade. The annual saving in curve-worn rail is approximately \$3,550 on the Catawissa grade, or a cost in curve-worn rail of 1.37 cents per ft per million tons of traffic in lieu of 1.80 cents.

The "Moly" flange sticks averaged 2,092 miles per stick, with 4 sticks per unit. Cost for the "Moly" sticks for one year of lubrication is approximately \$1,250, a net annual saving of \$2,300 on the Catawissa grade only. The estimated cost to apply four flange lubricators is \$111.75 per unit, for 31 units, is approximately \$3,500. Therefore, the return on the investment is approximately 65 per cent.

Because the units equipped are pooled in services beyond the Catawissa grade, the savings are cumulative on all curves where these units operate. Stick life is based on this pooled service, and was calculated from speed recorder mileages when sticks were replaced. An additional major saving with flange lubricators should be in locomotive wheel wear and the Reading is to report on this in the future.

15% more torque from
the same air pressure
while consuming 30% less
air! *It's the new*



Air impact wrench!

"Free as the air" is an expression which has little application to compressed air. Learn more about the truly remarkable efficiency of the new Sioux Air Impact Wrench.



Unexcelled Performance and
Durability....

*It's
the*



Electric impact wrench



When it comes to electric impact wrenches, here is the maximum in dependable power per dollar. Available in $\frac{1}{2}$ " or $\frac{5}{8}$ " drive.



PELICAN

Spin nuts on or off without touching them... it's the new **SIoux**

Pelican NUT ACCUMULATOR

Action of the impact wrench removes nuts and spins them up into the Pelican on a center stem. The stem will hold ten $\frac{3}{4}$ " or $\frac{13}{16}$ " hex nuts, either $\frac{7}{16}$ " or $\frac{1}{2}$ " thread. Reverse action spins the nuts back on. Stems can be removed with their load of nuts and empty stems installed in their place. Or, stems can be pre-loaded and placed in Pelican for assembly operations.

The Pelican may be used with any $\frac{1}{2}$ " or $\frac{5}{8}$ " square drive, air or electric impact wrench.



PELICAN
IN USE WITH
NEW SIoux
AIR
IMPACT WRENCH



LOADED
CENTER STEM



ALBERTSON & CO., INC.

SIoux CITY, IOWA, U.S.A.



LOOK UNDER
"TOOLS-
ELECTRIC"



WRITE
FOR THE
NEW
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NEW AIR IMPACT WRENCHES • NEW AIR SCREWDRIVERS • NEW "PELICAN" NUT ACCUMULATORS •
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LIX DIESEL CLEANERS

are MOST ECONOMICAL in the end!

Fast, efficient, economical maintenance is a must for the modern railroad. Developed through years of experience in the railroad cleaning field, LIX Diesel Cleaners meet this need perfectly.

With LIX, no scraping or brushing is necessary . . . grit, grime and caked carbon are **soaked away**—with speed and thoroughness unequaled in any other cleaner. Even hard-to-clean **LUBE OIL COOLERS** can be thoroughly cleaned with Lix. Lix Cleaners are **harmless** to all metals . . . and all metals can be cleaned in the same tank at the same time. Lix Cleaners leave no granular deposits . . . reduce after-rusting. They're **safer**, too (low in toxicity, not a fire hazard.) And because they have **longer life** without frequent charges, they're **more economical** in the end than "less expensive" cleaners!

The Lix line also includes evaporative type cleaners for **spray** use.

PROVE TO YOURSELF how you can **SAVE TIME** and **CUT COSTS** on periodic surface cleaning of locomotives and on overall cleaning of diesel parts . . . write or phone for a **LIX DEMONSTRATION** in your shop, without cost or obligation!

THE



CORPORATION
(OF MISSOURI)

300 WEST 80TH • DEPT. RL-10
KANSAS CITY, MISSOURI

"Leadership in Industrial Cleaning"

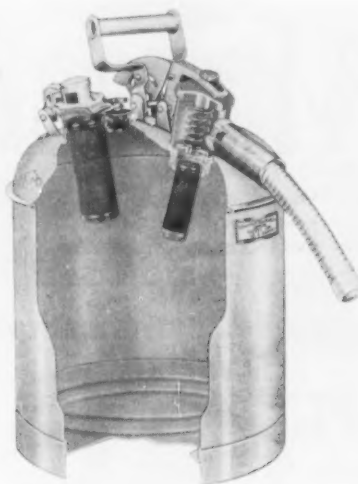
What's New

(Continued from page 12)

a small lever within easy reach of the thumb.

The 5081T tool runs at a free speed of 1,350 rpm, and will deliver 2,000 impacts per min at 90 psi air pressure. It weighs 9 $\frac{7}{8}$ lb.

The 5081 tool without torque control runs at a free speed of 2,000 rpm and, when impacting, also delivers 2,000 impacts per min. at 90 psi air pressure. It weighs 8 $\frac{3}{4}$ lb. The square driver measures $\frac{5}{8}$ in. across flats. Ingersoll-Rand Company, Dept. RLC, 11 Broadway, New York 4.



Safety Can

This "type 2" industrial filler-dispenser safety can, for use wherever flammable liquids are handled, is approved by Underwriters Laboratories, Inc., and Factory Mutual for handling or storing gasoline, oil, or similar liquids. It is made of 24-gauge terne-coated steel, and the body and breast are each "seamless drawn" from one-piece steel and welded together. Construction is further strengthened by a heavy 16-gauge steel hoop on the bottom of the can.

A combination "free-swing" carry-operating handle is designed for ease in using the can. To open, engage the handle in gear groove of connecting arm and press down. A flexible metal spout permits pouring or dispensing flammable liquids into small openings without spilling. The pouring spout and filler opening have double metal wire mesh fire baffles or screens for complete fire protection. There is a positive-acting valve at the base of the flexible spout. The can comes in 2 $\frac{1}{2}$ - and 5-gal sizes. Eagle Manufacturing Company, Dept. RLC, Wellsburg, W. Va.

Armature Coils

An armature coil with moisture resistant loop-ends and adjacent coil legs has been designed for longer life under adverse operating con-

(Continued on page 60)

With Baldwin conversion kits, you can modernize your VO engines at low cost



Modernized Baldwin VO locomotives are now operating on the Southern Pacific and on many other lines.

Maintenance and operating costs of your Baldwin VO units can be substantially reduced and their performance so improved that they will match that of the 600 Series engine. This is made possible by the application of new design parts now available in modernization kits for both 6- and 8-cylinder engines. These parts can be applied in your own shops.

Among many other advantages of modernizing your VO locomotive engine the Baldwin way are (1) fuel savings of more than 15%; and (2) substantial savings in cylinder head replacement.

The Baldwin conversion kits are the product of long and extensive research, and before their introduction they were subjected to field tests of the most exhaustive nature. For detailed information on a program that can save your road many thousands of dollars, write for a copy of our new Bulletin 2010.

Major features of conversion this Baldwin way

- New cylinder head with central injection can be directly applied to existing Model VO "A" frame; original bolting arrangement is retained
- Cylinder head is machined to accommodate the same valve gear and the same intake and exhaust valves used on Model 600 engines
- Pistons are identical with those on Model 600 engine
- A 1-piece, lightweight cylinder head cover is provided; also CC size fuel injection pumps designed to retain the original camshaft; fuel injectors with top inlet connection
- Larger fuel pump and pushrod rollers are provided

BALDWIN • LIMA • HAMILTON

Eddystone Division

Philadelphia 42, Pa.

Hydraulic turbines • Weldments • Dump cars • Nonferrous castings • Special machinery • Bending rolls • Machine tools



ditions. The new GE-752 armature coil has a forged lead paddle, resulting in tighter construction and a reduction in coil movement and vibration. During the forging operation, the entire length of the lead paddle is cold worked, resulting in a hard copper paddle which is resistant to metal fatigue. According to GE engineers, fatigue life is improved by as much as 17 to 1 over soft copper where high frequency vibrations are present.

Grounds, short circuits, and copper breakage have been minimized through the use of a very tight armature coil loop. Orphan type construction is used, allowing split coil operation without the necessity of making brazed connections between coils.

Additional insulation is applied to the corners of the coils, overlapping the ground insulation and continuing around the head of the coil leg. This added insulation not only seals the ends of the ground insulation, but also provides increased creepage distance. Additional loop reinforcing insulation is used. It consists of three quarter lapped silicone glass-backed mica tape covering the entire loop and extending well up the coil legs. Both conductor and ground insulation are full Class H. Outside tape consists of pre-treated glass tape to which varnish is applied under vacuum pressure. Straight portions of the coil are dipped in Permafil varnish and hot molded. Micamat ground insulation assures correct core slot fit regardless of time in storage prior to winding. Each new coil is tested to six times its maximum operating voltage. *General Electric Company, Dept. RLC, Schenectady, 5, N.Y.*

NOW...2
TORQUE RANGES
(to 900 Foot pounds)



both from one

Sturtevant
TORQUE WRENCH

Now you can do high torque work with a Sturtevant Torque Wrench of normal capacity range—small in size—light in weight—with fine increment markings and moderately priced.

With a new Multi-range, Multi-purpose Adapter you can step up the capacity of your Torque Wrench to a new high range and you can plug in any drive end you want... Box wrench, ratchet, drive square for sockets.

All drive end accessories are interchangeable and stock items.

In this way each Sturtevant Torque Wrench effectively equals two complete sets of ordinary single purpose Torque tools.

Adapter Slide rule sent FREE if requested on company letterhead.

PA Sturtevant Co.
ADDISON QUALITY ILLINOIS

Supply Trade Notes

(Continued from page 7)

vice-president, appointed president, succeeding *Harry J. Leddy*, retired.

Mr. Bootes joined ACF in 1947 in a sales capacity, became sales vice-president in 1949, vice-president in charge of marketing in 1955, and executive vice-president in February of this year.

ALBERT MANUFACTURING COMPANY.—*Robert E. Coughlan* appointed director of sales for new Albert lubricator pad and seals, which will be handled through the *Marquette Railway Supply Company* of Chicago. Mr. Coughlan was formerly associated with the *Miller Lubricator Company*.

GENERAL AMERICAN TRANSPORTATION CORPORATION; FREUHAUF TRAILER COMPANY.—An agreement between *General American* and *Freuhauf* gives *Freuhauf* the exclusive license to build and sell trailers and multi-purpose containers specifically designed for transport on *General American* Clejan piggy-back cars. *Freuhauf* will develop and promote a uniform type of container suitable for freight shipments on all forms of transportation. It will also build trailers.

DUFF-NORTON COMPANY.—*Edward H. Hodgson*, manager of sales promotion and marketing, appointed sales manager, *Worm Gear Jack Division*.

INSTITUTE OF THREAD MACHINERS, INC.—Address of Institute now P. O. Box 483, Greenwich, Conn.

ELECTRIC STORAGE BATTERY COMPANY.—*James G. Bouska*, assistant branch sales manager in San Francisco, appointed sales manager of Los Angeles branch of *Exide Industrial Division*, succeeding *Robert J. Muth* transferred to Philadelphia as field sales manager.

Boston branch of *Exide Industrial Division* moved from 100 Ashford street to a new building at 315 Mystic avenue, Medford, Mass.

ENTERPRISE RAILWAY EQUIPMENT COMPANY.—*Clarence J. Koranda*, sales engineer, appointed assistant to vice-president, sales.

STRATOFLEX, INC.—*C. A. Thomas*, vice-president of sales, named president and *John Tullis*, vice-president and general manager. *Ben Matheson*, New York representative, appointed sales manager.

NATIONAL FORGE COMPANY.—*National Forge & Ordnance Co.*, Irvine, Pa., has changed name to *National Forge Company*.

PULLMAN-STANDARD CAR MANUFACTURING CO.—*Frank L. Murphy*, assistant sales vice-president, Washington, D. C., appointed assistant vice-president in charge of railroad lading protection products' sales and service, with headquarters at Chicago.

K-W BATTERY COMPANY.—*Southland Battery Company* appointed exclusive sales representative in Texas and Oklahoma.



Robert G. Burson
Dayton Rubber



Arthur H. Morey
General Electric

DAYTON RUBBER COMPANY.—*Robert G. Burson* appointed general sales manager of *Mechanical Goods Division*, succeeding *Leonard C. Strobeck*, retired vice-president in charge of mechanical goods sales. Mr. Strobeck will establish offices in Dallas, Tex., where he will continue special staff and sales development work for *Dayton Rubber*. *Moffatt Sherard* and *Josh Montgomery* appointed sales engineers, *Industrial Division*, at Columbia, S. C., and Greensboro, N.C., respectively.

GENERAL ELECTRIC COMPANY.—*Arthur H. Morey*, manager of railroad Locomotive Advance Engineering Unit, will receive the *George R. Henderson Medal* from the *Franklin Institute* on October 15 for "his engineering contributions to, and his effective leadership in, the overall design, development and service testing of the successful 4500-hp *General Electric Company* gas turbine-electric locomotives. . . ." The locomotive, first developed after the Second World War (1946-1953), now has progressed to an 8500-hp locomotive.

ALCO PRODUCTS, INC.—*Robert W. Pittman* appointed sales manager for transportation products and services. *Robert H. Binkerd* named sales manager, industrial equipment, spring and forge division.

BALDWIN-LIMA-HAMILTON CORPORATION.—Cleveland office consolidated with Pittsburgh office at 1098 Union Trust building, Pittsburgh 19. **HAMILTON DIVISION.**—*E. L. Essley Machinery Company*, 565 West Washington Blvd., Chicago, appointed mid-central area sales representative for *Niles industrial and railroad machine tools*.

FINE ORGANICS, INC.—*Raymond P. Wasell* of Chattanooga, Tenn., appointed Tennessee agent.

BUDD COMPANY.—*Griscom Bettie, Jr.*, appointed sales representative, Disc Brake section, *Railway Division*. Mr. Bettie formerly a *Railway Division* sales representative.

Obituary

RICHARD C. WINKLER, vice-president and director, *W. H. Miner, Inc.*, Chicago, died September 1.

JOHN D. COLEMAN, 44, sales representative for diesel locomotive rebuild services at the *Alco Products, Inc.*, plant, Schenectady, N. Y., died suddenly August 22 while at work.

C. E. KINNAW, sales and service representative, Northwestern territory, *Hennessy Lubricator Company*, died August 25 in Santa Ana, Cal.

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your present costs

50 to 80%

Used today by 1/3rd of the
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Spray it-
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Easy to apply. No skill required. Produces the most accurate and durable type of lettering, numerals, medalion, and other types of markings. Adds long life to your identification or advertising on all your equipment . . .



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STUCKI
SIDE BEARINGS

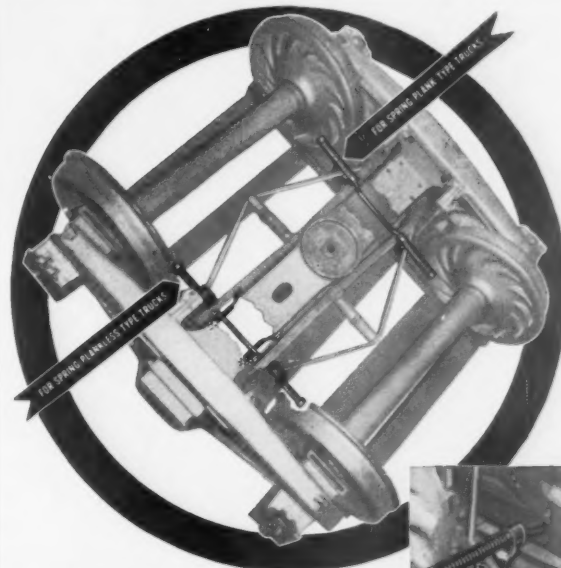
**FOR PROVEN DEPENDABILITY
LONG LIFE
HIGH CAPACITY
FREE SWIVELING TRUCKS**

MATERIAL:

**HIGH CARBON
ROLLED STEEL**

A. STUCKI Co.
OLIVER BLDG.
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THE IMPROVED **GRIPCO** BRAKE BEAM SAFETY SUPPORT



The Gripco Brake Beam Safety Support provides the greatest safety at lowest cost. Its dependability has been proven over years of actual service. Gripco Safety Supports are low in original cost, low in application cost and low in maintenance cost, even after years of service.



SPRING-PLANK TYPE



SPRING-PLANKLESS TYPE
(Safety Loops Included)

ENGINEERING IMPROVEMENTS

1. One design fits both 5'-6" and 5'-8" wheel base trucks.
2. One rod length and one spring length. One interchangeable casting fits both spring plank and spring plankless trucks.
3. Ideal for interchange repairs. New design permits easy and fast applications under all conditions. Nuts need not be removed to apply or remove the support.

OUTSTANDING FEATURES

1. An inexpensive trouble-free support for Rebuilt Car Programs.
2. Designed for spring plank and spring plankless trucks. Spring plankless trucks require safety loops which can be bolted, riveted or welded to the bolster.
3. Supports the brake beam in the event of brake beam or hanger failure.
4. Holds brake beam in horizontal position.
5. Holds brake shoe in proper position in relation to the periphery of the wheel.
6. The brake release feature pulls brake shoes away from wheel contact instantly when brakes are released.
7. Prevents unnecessary wheel and shoe wear caused by dragging brake shoes.
8. GRIPCO supports can be removed and reapplied without removing nuts; therefore nuts are furnished in proper position.
9. Brake beams, rods, and levers are held in position under spring tension thus reducing false movements, chattering and wear of hangers, hanger pins and brake heads.
10. Can replace as a billable repair any support except A.A.R. recommended practice (angle-riveted and welded).

A.A.R. APPROVED—PATENTED AND PATENTS PENDING
OTHER GRIP NUT PRODUCTS

AD NO. 110



Grip Lock Nut #1

Grip Holding Nut #2

Railroad Gripco Lock Nut #3

GRIP NUT COMPANY

Serving American Railroads Since 1904

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The sparkling-clean exterior appearance of your rolling stock tells a sales story of maintenance and efficiency far more powerful than any words or claims . . . a story which can mean real dollar profit to you at a cost of pennies when you use these:

MODERN MAGNUS METHODS

- **FOR COACHES:** Magnus RR-85 or RR-85B. Mild acidic type cleaner applicable to automatic washers or the pail-and-brush technique.
- **HEAD END CLEANING:** Magnus 1-RR. A very mild alkaline cleaner especially effective on the front end of diesels.
- **TRUCK CLEANING:** Magnus Solvite Truck Cleaner. Specially formulated for heavy-duty cleaning of trucks, wheels, fuel tanks and all under parts.

For full information on how you can turn your rolling stock into mobile salesmen, contact your local Magnus representative or write directly to Magnus, 77 South Avenue, Garwood, New Jersey.



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Coupler repair parts from National keep couplers operating better... longer

AAR Standard Type E Coupler Parts



Knuckle
No. E50



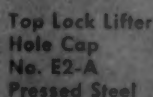
Lock No. E40



Knuckle Pivot
Pin No. C10



Top Lock Lifter
Hole Cap No. E2
Malleable Iron

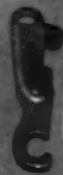


Top Lock Lifter
Hole Cap
No. E2-A
Pressed Steel



Top Lock
Lifter
Assembly
No. E6-A

Articulated Rotary
Locklift Assembly—
Single No. E24A



Articulated Rotary
Locklift Assembly—
Double No. E25A

Note: When ordering Lock Lifters for either top or bottom operated couplers, the complete assembly of lifter parts should be specified.

AAR Alternate Standard Type F Interlocking Coupler Parts



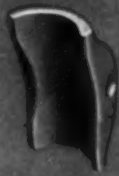
Knuckle
No. F51



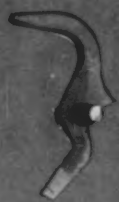
Knuckle Pivot
Pin No. C10



Lock,
No. F41



Pin Bearing
Block,
No. F65
and Pin Bearing
Block Retaining
Spring,
No. F66



Knuckle
Thrower
No. F31



Rotary Locklift
Assembly
No. F7



Rotor, Single
No. F8



Rotary Locklift
Assembly, F7
and Single
Rotor, F8
Assembled

AAR Standard Type H Tightlock Coupler Parts



Knuckle
No. H50-B



Lock
No. H40-A



Knuckle Pivot
Pin No. C10



Support Pin
No. C2



Rotary Lock-
lift Assembly,
Double,
No. H16-A



Knuckle
Thrower
No. H30-A



Rotary Lock-
lift Assembly,
Single,
No. H15-A

the railroads are moving ahead with **NATIONAL SPECIALTIES**

Ask your National representative for a copy of National's Illustrated Coupler Parts Catalog No. 12858 or write direct.

NATIONAL MALLEABLE and STEEL **CASTINGS COMPANY**

Established 1868

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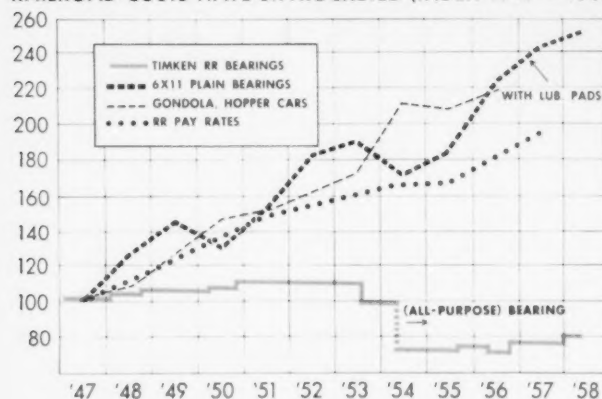
AA-8415

A plan to save the railroads \$288,000,000 a year can **START RIGHT NOW!**

1 PLANNED PROGRAM WILL MAKE "ROLLER FREIGHT" EVEN MORE PRACTICAL—When all freight cars roll on roller bearings America's railroads will save an estimated \$288,000,000 a year*—or \$144 per car. Here's one way the railroads can start working toward that goal right now—with a planned program for equipping all cars with roller bearings.

Every railroad might agree to put a certain number of cars on roller bearings every year. It would speed the day when all freight is "Roller Freight"—when the biggest savings can be realized. The railroads would get greater immediate benefits because they'd get back about as many cars as they put into interchange. And a planned program would help the railroads set economical shop schedules to reduce the cost of converting existing rolling stock. It would enable us to *plan* roller bearing production—automatically keeping the cost at a minimum.

TIMKEN BEARING COSTS HAVE STAYED DOWN WHILE OTHER RAILROAD COSTS HAVE SKYROCKETED (INDEX 1947 = 100)

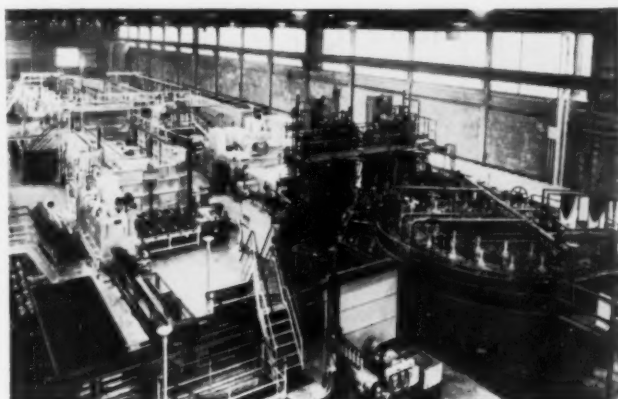


SOURCES: AMERICAN RAILWAY CAR INSTITUTE • INDEX FROM AAR—
ICC STUDY • AAR INTERCHANGE RULES

2 \$7,000,000 PLANT WILL KEEP COST OF GOING "ROLLER FREIGHT" DOWN—Our new Columbus, Ohio, plant (see photo) uses revolutionary production methods to produce up to 20,000 car sets a year—keep bearing costs down.

This unique plant is designed for a planned "Roller Freight" program . . . to make "Roller Freight" an even better buy. Right now the extra cost of equipping a freight car with Timken® roller bearings is almost 50% less than it was only 10 years ago. Mean-

while, the cost of friction bearings and other railroad purchases has been climbing (see chart). The price gap between Timken roller bearings and friction bearings has been greatly narrowed and use of this plant can help close this gap even more.



View of ultra-modern machinery that can hold railroad roller bearing costs down.

3 IMPROVED FREIGHT CARS WILL GET THE RAILROADS MORE BUSINESS—With more "Roller Freight" cars, you'll be able to get more business by *guaranteeing* faster, more dependable shipping. Timken tapered roller bearings end the No. 1 cause of freight train delays—the hot box problem. One railroad's cars on Timken bearings have rolled over 300,000,000 car-miles with only one over-heated bearing. That's because Timken bearings *roll* the load, don't slide it. Each car on Timken bearings means eight fewer potential hot boxes to worry about. And they cut terminal bearing inspection time. Each car on Timken "AP" bearings produced in our new plant will go at least three years without adding lubricant.

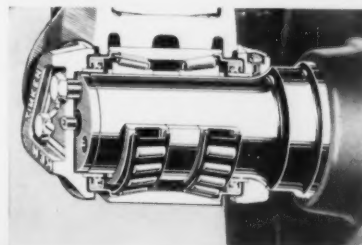
Already 69 railroads and other freight car owners have over 25,800 cars on Timken bearings— $\frac{1}{3}$ of them in interchange. Why not talk to other railroaders about planned conversion of existing rolling stock and equipping of new cars with roller bearings? Why not make use of your new railroad roller bearing plant? The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

*1958 revision of estimated total annual savings from an Economic Study of "Roller Freight" made by The Timken Roller Bearing Company. The study combines statistics furnished by the Association of American Railroads, the Interstate Commerce Commission, the University of Illinois and individual railroads.

TIMKEN

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**TAPERED
ROLLER
BEARINGS**



"Roller Freight" is the next great step in railroading